ROOM FOR DANCING ON: GRAZING SCHEMES IN THE COMMUNAL LANDS OF ZIMBABWE

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INTRODUCTION

> "Our idea is to have fenced paddocks in the grazing areas nearby the rivers, then rows of gum trees, then smaller paddocks closer to our fields where we will plant special grasses and fruit orchards, then our fields and homes. In the centre will be the central grazing area which we will use in winter, if only we can get water there. This central area still has some small buck, mene, which we prevent people from hunting. We want to protect all these natural resources, even the fish in the dam. We will only allow people to hunt or to catch fish if there are enough animals or fish. This was the dream of our fathers.....
>
> We know that if we look after our trees and grasses, then we will have room for dancing on!"
>
> (Frederick Mhiripiri, chairman of Chamatamba grazing scheme, January 1987).

In the late 1980s the chairman of Chamatamba grazing scheme, together with the rest of his committee, eloquently articulated their vision of how land use and resource management within Chamatamba's boundaries could be organised. This vision greatly impressed the many visitors to Chamatamba in this period, and was instrumental in securing for this prize-winning scheme large donations of funds and materials, as well as significant levels of extension support.

It was not always clear, however, just who the "we" was who had "room for dancing on". The dividing line between purely private projects, benefitting a local power elite, and community projects, in which benefits were more evenly spread, became increasingly blurred. The leadership of the scheme astutely invoked discourses of "community development" and "resource conservation" in their dealings with both outsiders and local residents. In doing so they did not succeed in mobilising high levels of community participation in the scheme, or in damping down dissatisfaction from those who felt excluded; on the other hand, these tensions did not lead to a collapse of the nascent common property regime, and by the end of 1990 the scheme was still managing to accommodate divergent interests.

The Chamatamba case made it clear that the question of power is central to any analysis of decision making in relation to grazing land. This has to include consideration of the ways in which ambiguous collective identities, such as those of "community", "kraal" and "lineage", are constructed and manipulated, and how these identifications intersect with structural realities such as a pattern of pervasive inequality in production assets and incomes.

A key factor in Chamatamba's success in containing internal conflict lay in its relatively well-endowed resource base. Stocking rates were well within those conventionally recommended

by officials, and its winter grazing reserve was judged by visiting ecologists to be underutilised - a rare condition in Zimbabwe's Communal Lands, and in stark contrast to the other case study schemes presented in this report. Thus another critical dimension in the analysis of grazing management schemes is that of how much "room" is needed for "dancing on" - in other words, the controversial issues of population pressure in communal areas, the sustainablity of grazing management regimes at high stocking rates, and the appropriateness of conventional grazing scheme designs in these conditions. Recent developments in rangeland theory suggest that these questions must be approached with an understanding of the **ecological dynamics** that underlie patterns of resource utilisation on communal rangelands. The influence of these dynamics on decision making and power struggles also needs to be examined.

Viewed against the backdrop of Zimbabwe's conflict-ridden agrarian history, it is not surprising that these two concerns - power relations and patterns of land use - emerge as critical issues. Both have been central in that wider history. Land use planning and resource conservation programmes were from their inception closely linked to attempts to increase levels of productivity. Beinart (1984) and Phimister (1986) have shown how this discourse of conservation first emerged in the 1930s as part of a state initiative to make settler agriculture more economically viable, and was then extended to the reserves (as the communal areas were then known). The notion of "carrying capacity", especially in relation to grazing land, came to play a fundamental role in the thinking of planners and conservationists.

However, many of the settler state's attempts to engage in land use planning and conservation in the reserves were fiercely resisted, and from their inception were inseparable from contestation over the control of resources. As Ranger (1985) has pointed out, the issues which fuelled rural support for the nationalist liberation struggle were the demand for the return of alienated lands, on the one hand, and a rejection of state interventions in locally evolved patterns of resource use, on the other.

In the post-independence era tensions between the state and rural communities in relation to land use have persisted. In part this may be due to the failure of the resettlement programme to significantly reduce the problem of land shortage, or to the oft-remarked tendency on the part of "peasants" to resist attempts by bureaucrats of any hue to impose restrictions on local decision making. The strong degree of continuity in technical approaches to land use planning, from the 1930s through to the 1990s, suggests another, perhaps fundamental, reason which has not received enough attention to date: the radical disjunction between the ways in which extension staff and local residents understand agro-ecological dynamics and imperatives. The case studies reported here illustrate some of the institutional and political consequences of this disjunction.

A somewhat submerged theme in the wider agrarian history has been that of inequalities and power struggles **within** "peasant communities". This has begun to change, and in recent years a number of studies of rural differentiation, gender politics and "struggles within the struggle" have emerged (eg. Weiner and Harris 1989; Amin 1991; Pankhurst and Jacobs 1988; Kriger 1988). This study attempts to contribute to this growing literature on political processes in rural Zimbabwe.

The original motivation for this study, however, was not primarily academic in character. The objectives were rather to inform decision makers in those government and non-government agencies concerned with rural development, shed light on the social dynamics of resource management in the Communal Lands, and make recommendations on the institutional design of communal grazing schemes. It is for this reason that the applied dimension of research, rather than the theoretical, is emphasised throughout this report.

The research project reported here collected data on decision making in five grazing schemes, in three different agro-ecological zones. Comparative analysis revealed that in respect of both power relations and ecological dynamics there were considerable differences between individual schemes, and that the relationship between these aspects was often complex. A conceptual framework derived in part from common property theory has been used to analyse institutional and political processes, but discussion of this theoretical framework is kept to a minimum.

In respect of ecological dynamics, however, more space has been devoted to a discussion of emergent theoretical perspectives in rangeland ecology. This is necessary because both the analysis of patterns of rangeland utilisation by herders and livestock, and the recommendations for policy makers, draw heavily on these still somewhat controversial perspectives.

The report begins with an overview of grazing scheme policies in the first decade of independence and a preliminary assessment of their successes and failures. The second section briefly summarises recent thinking in rangeland ecology and outlines what kinds of policy implications these new perspectives might have. The third section, comprising the bulk of the report, reports on ecological dynamics and institutional processes in the five case study schemes. A final section attempts to draw out lessons for policy and to make recommendations on grazing scheme design.

1. COMMUNAL LAND GRAZING SCHEMES IN THE 1980s

1.1 Livestock development policies and grazing management interventions

Programmes aimed at improving livestock production and range management in the Communal Lands have been a feature of state agricultural development policies from the 1920s through to the present. The assumptions underlying these initiatives, as well as the proposed solutions to perceived problems, have demonstrated a great many continuities.

The main assumptions have been that:

- communal area livestock production systems are inherently inefficient

- productivity is low because of poor management both of stock and of rangeland feed resources

- high stocking rates in excess of carrying capacity lead inevitably to severe environmental degradation

- cattle should be used for beef or dairy production; other uses are inefficient or less important

Implicit in this view is an assumed ignorance and "backwardness" on the part of producers, often accompanied by the notion that irrational cultural beliefs and practices in relation to livestock ("the cattle complex") are an obstacle to rational management decisions (Mtetwa 1978). Another view which has become increasingly influential over time is that which diagnoses the communal tenure system as problematic and in need of reform. Access to grazing is seen as unrestricted; exploitation of communal grazing land by privately held livestock means that a "tragedy of the commons" is inevitable (Barnes 1978: 52; Hayward 1984: 202).

Solutions to these perceived problems have generally included proposals to "educate" farmers through livestock extension programmes and to engage in some kind of reform of the communal tenure system. Improvements in range management have usually been premised on reduction and control of stock numbers, restrictions on access to communal rangeland by means of fencing, and management of grazing by means of rotational resting systems. In Zimbabwe this combination of measures has been known as a "grazing scheme". Extension officials have aimed to convince livestock owners to give up their "irrational beliefs" and aim instead at commercial production of meat or milk, and breeding programmes to upgrade indigenous stock have been introduced.

Grazing schemes for the Communal Lands have thus always been firmly based on the commercial beef production model which research and extension helped evolve in the Large Scale Commercial Farming sub-sector. Whichever grazing management system was in vogue within this sector has become the ideal to

be promoted within the Communal Lands, albeit in a simplified, diluted version suitable for peasant producers. Mainstream range science has developed techniques for assessing rangeland condition for use by extension staff working with commercial ranchers (Ivy 1969), and these have been enthusiastically employed on communal rangelands as well.

"Conservative" stocking strategies (Sandford 1983) have been strongly recommended, and estimates of the carrying capacity of range in different Natural Regions have been based on the need to stabilise beef production in a variable environment by preventing botanical changes in rangeland thought to be indicative of "degradation" (Scoones 1989).

The response of livestock owners in the Communal Lands to the recommendations of extension staff has ranged from guarded acceptance to outright hostility. Another theme running through the history of livestock development policy is the use of administrative authority to attempt to enforce change. Resistance to measures such as compulsory destocking had powerful political side-effects, however (Ranger 1985), and for the past 15 years the tendency has been to encourage local communities to themselves develop the institutional capacity to enforce the recommended management systems. The threat of forced destocking has remained, however (Republic of Zimbabwe 1986), and fears that this policy will be resurrected have informed community responses to grazing schemes in recent years.

Attempts to implement grazing schemes have always resulted in conflicts: within local communities, between scheme members and excluded neighbours, and between local communities and the state. The political and institutional dimensions of rangeland management have become increasingly important. Less recognised has been the ecological dimension, and the possibiity that underlying the responses of local communities to grazing scheme policies are ecological dynamics poorly understood by planners and extension officials.

1.2 The legal and planning framework

Since the early 1980s grazing schemes have been promoted within a legal and planning framework which has had the following as its four main components: communal tenure; a hierarchy of local government institutions reaching down to village level; villagisation and land use planning programmes; and model by-laws governing land use and conservation.

(a) The Communal Land Act of 1982 made the allocation of land in communal areas the responsibility of District Councils, which are directed to "have regard to customary law" and to "grant consent to persons who according to the customary law of the community...are regarded as forming part of a community" (Republic of Zimbabwe, 1982b: 136). Thus although a new local government institution based on universal suffrage has been given authority over the allocation and use of communal land, the underlying system

of "communal tenure" has not been subject to legal redefinition. A fundamental feature of the system is the right of access to common property resources such as grazing, woodland, thatching grass and water supplies which membership of a local community entails.

(b) In February 1984 the Prime Minister issued a directive announcing the establishment of a new structure of local government and development planning. The structure included Village Development Comittees (VIDCOs), Ward Development Committees (WADCOs), Rural-District Councils and Provincial Councils headed by Provincial Governors. It was intended to bring about a decentralisation of planning and supervision and greater participation of local communities in development planning (Murombedzi 1987). A large scale exercise to delineate the boundaries of VIDCOs and WADCOs took place in 1984/5; VIDCOs incorporated about one hundred families and WADCOs represented six VIDCOs. This delineation was carried out without regard to natural resource endowments, for example, grazing areas used by different villages.

(c) In 1986, a pilot "villagisation" programme was initiated in 55 villages, one in each of the 55 districts. The Department of Agricultural Technical and Extension Services (Agritex), together with the Department of Physical Planning, was directed to demarcate arable and grazing areas, assess overall water requirements for human, stock and irrigation purposes, and plan for consolidated village settlements. The aims of this programme were twofold : to make easier the provision of services such as water and electricity to rural communities, and to reorganise land use in the Communal Lands. The rationale for these initiatives was stated most explicitly in the first Five Year National Development Plan (1986-1990), which announced government's intention to re-plan land use patterns in the Communal Lands in order to achieve "optimum exploitation of the agricultural resource potential on a sustainable basis". Internal reorganisation was seen as a form of resettlement, "on the basis of which potential settlers for the translocation resettlement mode are identified". With regard to livestock a "comprehensive national programme", including stock control, better land management and "destocking where necessary" was envisaged (Republic of Zimbabwe 1986: 27-28).

(d) The Communal Land (Model) (Land Use and Conservation) By-laws of 1985 were designed to be adopted by District Councils and take effect as if they were by-laws made by the Council itself. Councils may specify "grazing areas", and in consultation with the District Administrator "specify the maximum number of livestock which may be grazed" within these. The Council may also require owners to reduce their stock.

Attempts to make this an effective institutional framework for

rural development have encountered many difficulties. The situation with regard to the communal tenure system, for example, is confused. Few District Councils, if any, have effective authority over the allocation of land, and a common situation is that reported in Gutu in 1985: "... (there is) widespread confusion between party structures, village development committees and chiefs in Gutu communal land over who had authority to allocate land" (The Herald, 17/12/85). In many communities the kraalhead (sabhuku) is still the most widely recognised authority with respect to land (Cousins 1990a).

It is not known exactly how many District Councils have adopted the model by-laws, but no cases of their effective implementation have been reported. VIDCOs and WADCOs have experienced many difficulties and are discredited institutions in some communities (Murombedzi 1987; Cousins 1990a). Villagisation and land use planning have been actively resisted in some areas (Drinkwater 1989: 304; Derman 1990; Scoones 1990: 460), and the tension between central and local control of land use which marked the history of relations between the state and the peasantry in the colonial period has strongly re-emerged in the post-independence era.

1.3 Grazing schemes and agrarian reform policies

Zimbabwe's post-independence resettlement programme, despite its relative success at addressing the dislocations of the war years, has not been able to radically transform the inherited colonial agrarian structure. Since the mid-1980s the design of a more thorough-going agrarian reform strategy has been much debated, and questions of livestock production, grazing land management and communal tenure have been central to this debate.

Cliffe's influential FAO consultancy report of 1986, for example, saw problems of grazing and draught power shortage as critical factors in the generalised imbalance between people and resources in the Communal Lands. The report recommended that reform proposals take into account significant regional variations, and in particular the contrast between the "relatively fertile and less overcrowded north versus the barren, populous south" (Cliffe 1986: 23), and the needs of the poorest families, in particular the stockless and households headed by women.

While intensification of production in the Communal Lands was seen as essential, mechanisation of tillage is appropriate only to high potential areas with little grazing left, and this in the medium term. The central function of cattle of supplying draught power for crop production must be recognised and supported in most regions.

According to Cliffe reorganisation of land use, as in the Mwenezi Radical Land Reform Programme (MRLRP), could bring advantages, but many communal areas would still be short of land in the absence of significant external resettlement. Resettlement as an extension of Communal Land grazing areas, as in the Model D scheme, is an urgently needed measure in the low potential,

overcrowded areas in the south.

Since destocking programmes are both unpopular and worsen the draught shortage problem, this is no solution. Improving the productivity of grazing land through planting legumes and through grazing schemes needs to be explored further. Individualisation of grazing would be at the expense of the stockless and is therefore not appropriate, but the mechanics of managing grazing schemes needs more attention. Policies which encourage the sharing of livestock so that the sizeable minority of stockless households have secure access to draught should be an important part of any reform package.

With regard to tenure reform, Cliffe recommended that a form of communal tenure be retained in Communal Lands. Community control of land allocation and land use is an extension of the existing system of tenure, and the allocation of land rights could be democratised by giving this authority to representative bodies such as VIDCOs. This would lead to the possibility of the improved management of land use, especially grazing, and the reallocation of land rights to meet changing needs.

A National Symposium on Agrarian Reform held in late 1987 debated these recommendations, and again recognised the central significance of communal grazing management: "... it was felt that the issue of grazing deserved serious attention because it was often the most serious constraint on agricultural incomes in the dry Communal Areas which are the majority..." (Republic of Zimbabwe 1987: 24). Three recommendations were made:

> (a) Communal grazing should be the basic pattern especially in Regions III to V, but where ecologically feasible, and where desired, individually managed plots could be demarcated.
>
> (b) A concerted effort should be made to promote research on communal area farming systems, and especially on improvement and management of grazing areas.
>
> (c) Management of the commons should be in the hands of the resource users through VIDCOs and similar institutions. Grazing management committees under VIDCOs should use locally evolved by-laws to manage the environment and "livestock numbers could then be matched to ... carrying capacity" (Republic of Zimbabwe 1987: 25).

Other views have been expressed on these controversial issues by various interested parties. In 1989 the organisation which supposedly represented all Communal Land farmers (but in the eyes of many has stood for the interests of only a narrow layer of wealthy "Master Farmers" - see Bratton 1990), the National

Farmers Association of Zimbabwe (NFAZ)[1], came out in favour of individualised leasehold (and eventually freehold) tenure over both arable and grazing land (NFAZ 1989).

In contrast, a statement on agrarian reform in 1990 by the Joint Presidents' Agricultural Committee (JPAC), representing all three farmer's unions, limited itself to calling for measures to increase herd offtake in the Commmunal Lands and the allocation of more government resources for grazing schemes and livestock improvement.

The draft National Livestock Development Policy of 1988 also placed great emphasis on increasing offtake, to be achieved through the promotion of grazing schemes, a "massive educational campaign" to promote cattle as a "cash crop", and supportive measures such as improved marketing facilities. On the grazing schemes "... principles of range management will be strictly adhered to" (Republic of Zimbabwe 1988: 29).

By the early 1990s these debates had not yet resulted in clear government policies with regard to communal tenure and grazing management, in Communal lands or resettlement schemes.

1.4 Grazing scheme programmes after independence

A detailed account of grazing scheme programmes in both the pre-independence and post-independence periods is contained in previous publications (Cousins 1987; 1992). A brief summary is provided here as background to the discussion which follows.

Early initiatives

In mid-1982 the Chief Veld and Pastures Officer at the headquarters of the Department of Agricultural Technical and Extension Services (Agritex), sent a memorandum on grazing scheme extension to all Provincial Agricultural Extension Officers. The memorandum advised field staff to give maximum publicity to the idea of grazing schemes, to engage in a training programme which would start at District Council level and work its way downwards, to reintroduce grazing competitions, and to start schemes only "when the people wanted them". Planning was to be kept simple and overstocking disregarded for the time being. The memorandum stated that the technical design of schemes should be based on Short Duration Grazing (SDG), with four to eight paddocks per scheme.

It was also advised that funds for fencing were available from the European Economic Community (EEC) and a formula for sharing of costs was laid down; 25% from the community (in the form of either cash or labour for fencing), 25% from government (mainly

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[1] The NFAZ has since been amalgamated with the Zimbabwe National Farmers Union (ZNFU) which formerly represented small scale commercial farmers.

in the form of staff salaries and transport), and 50% from the donor (for purchase of wire and fencing standards). Project proposals had to include a detailed plan of the scheme, an estimation of carrying capacity, and proposed stocking rates. The community concerned had to agree to take action to maintain the viability of the scheme, usually in the form of stock limitation. In some cases a set of by-laws regulating the operation of the scheme had to be drawn up and signed by grazing scheme committee members before funding was approved (Cousins 1988).

Subsequently, other donor agencies also began to assist in the setting up of schemes, notably the Lutheran World Federation (LWF) and the German Agency for Technical Development (GTZ). The Mwenezi Radical Land Reform Programme (MRLRP) in Masvingo Province had its genesis in 1982 when an energetic District Administrator and some of the elected District Councillors began to promote the idea of a voluntary reorganisation of settlement patterns. Mwenezi was given a great deal of publicity, and some government planners intended that it should form the pilot scheme of a National Land Use Programme (for a more detailed account of the MRLRP see section 3.5 below).

1982 saw the onset of a severe drought which was to last three years and which resulted in reduced forage production and increased cattle mortality rates in many Communal Lands. It may be that the positive response given to Agritex's initial programme of grazing scheme extension was prompted by livestock owners' experience of the often absolute lack of available forage in many areas at this time. The decline in stock numbers was seen by some extension staff as an opportunity to begin grazing schemes with stocking rates closer to those recommended by veld and pasture (rangeland) specialists.

Characteristics of grazing schemes in the mid-1980s

A survey of current grazing schemes in the Communal Lands was carried out in late 1986 (Cousins 1987). Data from a total of 106 schemes were analysed, estimated as representing 85 percent of operating or planned schemes at that time.

Grazing schemes still at the planning stage numbered 56, and 50 were claimed to be operational; of these 36 were unfenced or in the process of being fenced and 14 were fully fenced. Schemes were found in all agro-ecological zones except Natural Region I, and over half were located in Regions IV and V. A Short Duration Grazing (SDG) system was being practiced or proposed by 66 percent of all schemes, with a rotational rest system being used by another 23 percent, of which the majority were unfenced schemes.

Despite the fact that 83 percent of schemes were in Regions III to V, where recommended stocking rates are between 1 Livestock Unit (LU): 6 ha and 1 LU: 15 ha, in 84 percent of all schemes the stocking rate was higher than 1 LU: 4 ha.

Nearly 43 percent of all schemes had first operated in the pre-

independence era and had been revived since 1980. Donor assistance for the purchase of fencing materials had been provided to all 14 fenced schemes and promised to another 20, of which 5 were operating unfenced schemes and 15 were being planned. The EEC was the largest single donor agency (13 schemes).

The most commonly perceived benefit of a scheme, as reported by extension staff, was the reduction in herding time afforded by fencing. Improved cattle performance and rangeland condition were also mentioned by significant numbers of respondents. The most commonly perceived disadvantages were the fear of stock limitation and potential conflicts either with neighbouring communities or within the community. Boundary disputes were reported in 36 percent of the schemes, and these were more likely to occur in the case of fenced schemes. Internal conflicts derived most commonly from the need to have some homesteads or arable fields relocate out of grazing areas.

The great majority of schemes (89 percent) had elected management committees, and "traditional" leaders (kraalheads, headmen or chiefs) were found on 86 percent of these. By-laws were reported as having been agreed to by 72 percent of schemes with committees. Non-cattle owners participated as equal members of the scheme in all cases except one, and equal contributions of cash or labour for the erection of fences were expected from all members in 82 percent of schemes.

About a third of these schemes were roughly the size of a VIDCO in terms of numbers of households (71-140), and two thirds wer either much bigger or much smaller. The relationship between VIDCOs and grazing scheme committees was variable but in most cases not clearly defined. By-laws for managing the schemes were usually suggested to communities by extension staff rather than originating from within, and their adoption was often a pre-condition for receiving donor assistance. Most by-laws gave Agritex staff the authority to determine stocking rates and the timing of rotations.

This report recommended that unfenced grazing schemes be further investigated since they appeared to have the potential to overcome some of the common problems faced by grazing schemes. Herding livestock between beacons or markers obviated the need for expensive fencing which communities could not themselves afford, and implementation of a scheme was thereby speeded up. The lack of fencing appeared to reduce the likelihood of boundary disputes because of a greater flexibility as to "whose cattle graze where". Greater flexibility in decision making on stocking rates and rotations also appeared to be possible.

A sample of 31 of these 106 schemes was visited between late 1987 and early 1988 in order to investigate in greater depth aspects of decision making and conflict within grazing schemes (Cousins 1989). This survey revealed that boundary disputes were much more common than reported by extension staff (they occurred in 77 percent rather than 36 percent of cases), and levels of internal

conflict were also high (35 percent experienced major internal conflicts). This was more likely in planned than in operating schemes.

In 14 schemes the views of respondents on the viability of unfenced schemes were obtained. In 4 of these it was felt that grazing management without fences was possible, but many problems were caused by the invasion of neighbours' cattle and by the difficulties of herding within unfenced "paddocks". In 10 cases respondents felt that these problems made the whole notion completely unviable. There was generally little enthusiasm for unfenced schemes.

In 14 schemes by-laws included rules regulating resource utilisation in one form or another (e.g. rotational grazing, tree felling, cutting of thatching grass). In only 7 cases did grazing scheme members state that the by-laws included a provision for the control of stock numbers. In 4 schemes which were EEC funded it was found that two sets of by-laws co-existed. A formal set, drawn up Agritex or the District Council, and signed by the committee as a precondition for funding, included a stocking rate by-law. Another set appeared to have been drawn up at community or committee meetings and included rules not appearing in the "official" by-laws; these made no mention of stocking rate controls.

These surveys revealed that the planning and implementation of grazing schemes had become problematic in respect of: the high cost of fencing and the boundary disputes it tended to generate; the sensitivity of the issue of stocking rates and control of stock numbers; ambiguity as to where the locus of institutional control over stocking rates and grazing rotations lay; lack of clarity on the relationship between grazing scheme committees, "traditional" leaders and VIDCOs; and a perceived shortage of grazing land in many communities (Cousins 1987: 68).

Grazing schemes in the late 1980's and early 1990's

The late 1980's saw the initial enthusiasm with which donors had greeted the grazing scheme programme diminish somewhat, and by the early 1990's most fencing for schemes was being provided by District Administrators' offices as part of the Food-for-Work or Public Works programmes.

An evaluation of EEC funded grazing schemes was carried out in late 1987 (Cousins 1988). The report found that overall the schemes had the potential to increase the capacity of local communities for resource management, but that there were a great many problems with the way they were being implemented. It recommended that grazing schemes continue to be vigorously promoted by Agritex and supported by the EEC, but that a number of modifications be made in the approach adopted. These should include a firm statement by central government that stock limitation would be voluntary, a clearer focus on institutional development, greater community participation in planning and management, and the development of by-laws which reflect a

community's actual intentions with regard to resource management rather than being simply a means to secure external funding. It also recommended research into the vexed issue of carrying capacity and alternative designs for grazing schemes.

The EEC Micro-projects Fund, however, appears to have discontinued funding of Communal Land grazing schemes since then; only 2 schemes in resettlement areas have been financed since 1988 (Nobbs pers. comm.). Although less than half of the funding promised to the Mwenezi Radical Land Reform Programme has been released since 1984, release of the remainder by the Fund was dependent on a full accounting of the funds already disbursed. The Batanai District Council, the implementing agency, has been unable to provide this in the absence of either the District Administrator who initiated the programme in the early 1980's, (since transferred elsewhere), or supporting documentation. Local government has supplied a certain amount of fencing for the programme in recent years.

In 1989 a World Bank/IFAD mission visited Midlands Province to assess the viability of a planned rural development programme which had ward-based grazing schemes as a major component. Because of doubts as to the economic rate of return on costly fenced paddocks this component was not approved. A number of NGO rural development agencies have continued to fund grazing schemes in various locations (e.g. Christian Care in Sengwe, World Vision in Vugwi), but these have tended to be isolated cases.

The most consistent donor has been the German Agency for Technical Co-operation (GTZ) which has continued to fund grazing schemes as part of the Co-ordinated Agricultural and Rural Development (CARD) programme in Gutu District. Sibanda (1990: 144) reported that 15 schemes had been planned by 1990 and of these 12 had reached the implementation stage, while in 3 agreement had not yet been reached with the communities concerned on issues such as the proposed reduction in cultivated area in order to increase the area available as grazing.

The CARD approach has attempted to be flexible and open to modification by local communities while remaining "technically sound" in the eyes of the land use planners. Through a drawn out process of meetings and discussions a "compromise solution" is sought which involves the consolidation of cultivated, residential and grazing areas, the reduction of cultivated fields, and the standardisation of field sizes within the consolidated blocks. SDG rotations are recommended within fenced paddocks. Sibanda reports that many institutional problems have been encountered in respect of VIDCO and ward demarcations, and as a result of conflicts between kraalheads, VIDCOs and Councillors (Sibanda 1990: 145).

Parastatals involved in rural development have also promoted grazing schemes; most notable is the Dairy Development Programme which was first located within the Dairy Marketing Board (DMB) and now falls under the Agricultural Development Authority (ADA). Grazing schemes have been proposed in several communities to

contribute to the upgrading of feed resources required for improved levels of milk production off communal rangeland (Henson pers. comm.)

Recently the Forestry Commission has proposed the development of grazing schemes in state forests which adjoin communal areas, in order to promote the controlled utilisation of forest land. The Mafungabisi Project in Gokwe District is the pilot scheme, and the project document proposes a "very conservative stocking rate and a flexible grazing system" rather than the standard Agritex SDG plan, as well as a strong emphasis on community involvement in planning (Forestry Commission 1990).

Since 1988 most fencing for grazing schemes has been provided by local government bodies, usually the District Administrator's offices. Agritex staff are still required to undertake planning of these schemes but the signing of by-laws is not usually a precondition for assistance. In some cases fencing work has been carried out under the Food-for-Work drought relief programme, and the fencing materials are usually provided from public works budgets. Often these schemes are seen as part of the "communal area re-organisation" programme which the Ministry of Local Government, Rural and Urban Planning is responsible for. In Zimuto Communal Land, for example, at least 9 such schemes have been fenced since 1988, but implementation of rotational grazing has been problematic. Some schemes in Zimuto have suffered boundary disputes and fence cutting, while others have not been supplied with gates and herding of livestock is still necessary.

1.5 Evaluating grazing schemes

How successful have been the policies and programmes promoting grazing schemes in the Communal Lands of Zimbabwe? On the basis of the surveys and reports mentioned above, the following criteria will be used to make a preliminary assessment: rate of adoption; the extent of stock reduction and control of animal numbers within schemes; the degree of implementation of grazing management recommendations; improvements in range condition or animal productivity; and the emergence of institutional capacity for the management of communal rangeland. These criteria would seem to be the most relevant given the objectives defined by the makers of these policies themselves. This assessment will be returned to later in this report, and reconsidered in the light of the detailed case studies reported in section 3.

Rate of adoption

The history of grazing scheme programmes shows that attempts to impose them on communities have generated opposition, often because of the forced destocking that has accompanied them. A "persuasive" approach has yielded a more positive response, as in Victoria Province in the 1970s (Froude 1974).

Cousins' survey in the mid-1980s estimated that approximately 125 schemes were operational or planned in the country as a whole, and multiplying this figure by the mean size of surveyed schemes

(160 households and 1213 ha - see Cousins 1987: 34) yields a total of around 20 000 households and a fenced area of around 150 000 ha. On the optimistic assumption that all the planned schemes would become operational, this would mean a coverage of about 2.5 percent of the Communal Land population. A more realistic assumption that half of the planned schemes would become operational would mean a coverage of around 1.6 percent.

The primary motivation for adopting a grazing scheme has most often been reported as being the reduction in herding labour that fenced paddocks afford, but with improvements in cattle performance and grazing conditions also said to be expected by community members (Cousins 1987; 47; Cousins 1988: 58). Some authors have speculated that these improvements may be expected by livestock owners not so much as a result of rotational grazing, but rather as a result of the exclusion of neighbours' livestock that fencing makes possible (Scoones 1990b: 13), and "the desire to secure preferential access in circumstances of land inequality" (Scoones and Wilson 1989: 105) and that this may be the major perceived benefit of a scheme.

Chinembiri reported that in 1988 there was "great interest in grazing schemes countrywide", but that the high cost of fencing (Z$ 1300 per km) and the uncertainties around continued donor support made the future of the programme uncertain (Chinembiri 1989: 148). A host of other problems have made adoption difficult in communities targeted by planners: eg. boundary disputes, shortages of grazing land, internal conflicts and factional struggles, fears of destocking, unwillingness of households to relocate out of grazing areas, and unwillingness of non-livestock owners to contribute (Cousins 1987, 1988, 1989; Kundhlande and Mutandi 1989; Sibanda 1990).

Thus in the period since independence the response of communities to proposed grazing schemes has often been positive. A range of motivational factors has contributed to this response, some possibly having to do with claiming exclusive access to rangeland rather than a desire to manage it, but coverage of the rural population has been limited by a number of difficulties.

Stock reduction and control of animal numbers

Control of livestock numbers has been an important objective of grazing scheme programmes, even when policies of enforced destocking have been abandoned and attempts to at least stabilise present stocking rates by encouraging increased offtake through sales have received greater emphasis. This is why by-laws proposed to communities by external agencies have generally included rules stipulating that livestock numbers should remain within recommended stocking rates.

Danckwerts (nd) reported that some of the Victoria Province schemes in the 1970s attempted to limit stock numbers, but there is little evidence of limitation in post-independence schemes. Stocking rates in implemented grazing schemes have remained high and generally been between twice and four times those recommended

by research and extension (Cousins 1987: 36; Cousins 1988: 73; Cousins 1989: 344: Kundhlande and Mutandi 1989: 413). By-laws agreed within communities have generally not included provisions for regulating stocking rates (Cousins 1989: 351), and members of grazing schemes have most often expressed the hope that stocking levels would increase after the adoption of a scheme (Cousins 1988: 59). Grazing schemes have thus failed to make much impact on stocking rates on communal rangeland.

Implementation of grazing management recommendations

Since the late 1960s the grazing system recommended by extension staff to both commercial and communal area producers has been Short Duration Grazing (SDG).

Assessment of the extent to which schemes have actually followed the recommended grazing system is difficult. Danckwerts (nd) reported that rotational grazing was being practised in some of the schemes he studied. Of the 18 EEC funded schemes visited by Cousins in 1987, only 7 had become operational, and all of these claimed to be implementing a SDG system (Cousins 1988: 70). Kundhlande and Mutandi (1989: 415) state that in the CARD programme schemes in Gutu improvements in range condition have been achieved under "good grazing management", which appears to imply SDG rotational grazing.

Of the sample of 31 schemes visited by Cousins in 1987 and 1988, 17 claimed to be operating a SDG system, and 4 claimed to be using some form of the older rotational rest system. However, only 4 schemes of the 24 with by-laws had ever imposed sanctions for infringements of by-laws (including those relating to rotations) (Cousins 1989: 352).

One of the reasons assessment is difficult is because of the possibility of great discrepancies between the claims made by members of schemes and their actual practices. Claims to be practising grazing management help to preserve the reputation of adopting communities in the eyes of government officials and donor agencies, and thus enhance the prospects for further development assistance. (See the example of Ndambani, winner of the National Conservation Competition in 1988, given in Cousins 1990c, where the fenced paddocks were used as a winter grazing reserve but records were kept which purported to show implementation of SDG.)

Evidence of the non-implementation of rotational grazing systems in 7 schemes is provided in the annual reports of the Agritex Veld Trend Monitoring programme, the second of which concludes:

> As reported in the 1986/87 report there is a need for grazing scheme committees to enforce their by-laws. The implementation of a rotational grazing system and adherence to it is of paramount importance if we are to see any changes in the veld (Mupangwa 1988: 17).

According to Scoones grazing practices, instead of following SDG,

> .... often involve adaptations of pre-scheme local grazing practices (eg use of deferred grazing, use of vlei/river bank resources) or the initiation of new ones (eg use of reserve grazing along fence lines or adjacent to roads) (Scoones 1990b: 13).

The available evidence on implementation of rotational grazing systems is inconclusive, but there are grounds for scepticism with regard to claims that SDG has been implemented.

Improvements in range condition and animal production

Assessment of improvements in range condition or animal production as a result of a grazing scheme is also difficult. Changes are hard to detect in the short term, and observed changes may be the result of factors such as higher rainfall or the exclusion of outsiders' cattle (ie. a reduction in stocking rate in one portion of rangeland, with a corresponding increase elsewhere). In addition, the validity of conventional assessment methods, such as the use of indicator species, has been questioned in recent years (Abel and Blaikie 1989: 11).

Again, the available evidence is inconclusive. Robinson (1951: 5) claimed that an early grazing scheme in Zimutu Reserve had "... improved both vlei and upland pastures and increased the carrying capacity of the reserve." Danckwerts (nd: 58) reported "considerable improvement" in range condition in some schemes in the early 1970s, despite high stocking rates. Kundhlande and Mutandi (1989: 413) assert that schemes in Gutu showed "some veld improvement" after two years. In none of these cases was quantitative evidence in support of these conclusions presented.

In the EEC evaluation study carried out in 1987 Agritex staff assessed range and cattle condition in 7 grazing schemes which had been operational for 1-2 years, but no definite conclusions could be drawn (Cousins 1988: 70-74). In one scheme the range was judged as showing "definite signs of regeneration", but in others condition was assessed as either stable or showing no signs of improvement. There was a poor correlation between cattle condition and range condition, and also between cattle condition and stocking rate within the area enclosed by fenced paddocks.

Abel and Blaikie (1989: 9-12) attempted to systematically assess and quantify differences between rangeland and cattle inside and outside of fenced grazing schemes "with known and relatively long histories of good management". No significant differences in cattle condition were detected. Rangeland inside the grazing schemes had better litter cover and less bare ground than range outside, and species composition (in terms of the conventional wisdom on indicator species) was more favourable inside the schemes, but it was clear that "no spectacular changes in vegetation condition have occurred". Scoones (1990b: 12) commented that these findings may reflect differences in stocking rate rather than "good management".

Institutional capacity for management of communal rangeland

In "open access" property regimes there is no exclusion of non-members of a resource user group and individuals use such resources without regard for the consequences of their behaviour on others. In common property regimes, by contrast, there are clear membership criteria for a group of resource users, communally defined guidelines for resource use exist, and enforcement mechanisms for punishing deviant behaviour are defined and used by the group (Bromley 1989: 872). A "minimum" definition of common property obtains where membership is well defined and non-members are excluded from resource use (Lawry 1990).

Grazing schemes have attempted to install the more developed version of common property by defining exclusive grazing territories with well demarcated boundaries, agreeing on by-laws which define rules for resource use, and electing committees which are supposed to keep detailed records, raise cash for fence maintenance, organise work parties, decide on grazing rotations and enforce scheme by-laws.

In the Victoria Province schemes of the 1970s extension officials devoted a great deal of time to helping committees to form (Froude 1974), and Danckwerts (n.d.) found these to be effective when they had the support of "traditional" authorities.

Surveys by Cousins (1987, 1988, 1989) reported that post-independence schemes generally elected committees, that "traditional" leaders sat on most of these, and that almost all communities with operational schemes agreed on by-laws. In some cases these were suggested by external agents (extension staff, donors or the District Council), but in others they appeared to have originated within the community in discussions of resource management issues; the latter tended to ignore the question of stocking rate regulation.

The performance of the committees in carrying out the tasks assigned them was assessed, and many were found to be deficient in respect of record-keeping, implementation of by-laws (particularly the imposition of penalties), and organising fencing repairs and maintenance. Nevertheless, in the majority of cases the committees were judged to be local institutions which enjoyed community support, with the potential to develop greater resource management capacities. Realising this potential would necessitate greater support from extension agencies which have tended to under-value the importance of institutional development in the communal areas (Cousins 1988: 118-119).

Another common problem was the lack of clarity in the relationship between grazing scheme committees and VIDCOs, and between scheme and VIDCO boundaries (Cousins et al 1989: 425; Sibanda 1990).

In the survey of 31 schemes carried out in 1987/88 it was concluded that

> ... grazing schemes are at present a focus for an emerging redefinition of 'community identity' in the Communal Lands; some groups are defining their boundaries in relation to the physical boundaries of their grazing land and developing sets of rules for the management of shared resources (Cousins 1989: 365).

Scoones and Wilson (1989: 106) are more sceptical of the motivations of communities adopting grazing schemes, which may "be rooted in the efforts of communities to secure better than average grazing areas for themselves". Despite the problems Scoones and Wilson identify in respect of the definition of boundaries, a "lack of clarity of rights", and the "lack of will to use oppressive, punitive machinery to sanction others", they do allow for the possibility of effective institutions emerging. The conditions for this

> ... remain unclear, but must combine the definition of suitable management units, the identification of the appropriate scale of organisation to be responsible for management, the resolution of conflicts over overlapping rights and the involvement of both rich and poor (Scoones and Wilson 1989: 109-110).

Summary

Grazing schemes have been adopted by a number of communities in the Communal Lands in the post-idependence period, but the proportion of the total population covered is still very small. Recurrent difficulties have been the high cost of fencing, uncertainties as to the economic benefits of schemes, and a generalised shortage of grazing land to support growing human and livestock populations. The planning and implementation of schemes has entailed a number of conflicts both between and within communities.

Control over livestock numbers has not been achieved within grazing schemes, despite donors sometimes making a commitment to regulating stocking rate a precondition for funding. Communities have often claimed to be operating the recommended SDG rotational grazing system, but doubts exist as to whether this has taken place in practice to any significant degree. The evidence on improvements in rangeland condition is inconclusive, and the possibility exists that those improvements which have been observed have been due mainly to exclusion of outsiders' stock and a consequent reduction in stocking rates within fenced paddocks.

The election of grazing scheme committees and the formulation of by-laws have together created the potential for an institutional capacity to manage communal rangeland to emerge. In the absence of efforts to firmly regulate use of rangeland resources or enforce by-laws, however, this potential has not yet been realised. Part of the problem may lie in the generalised neglect

of institutional development by government agencies, and unresolved ambiguities and inconsistencies with respect to the communal tenure system, the structure of local government, and agrarian reform policies.

2. EMERGING PERSPECTIVES IN RANGELAND ECOLOGY AND MANAGEMENT

This section summarises emerging perspectives in rangeland ecology which are leading to a re-appraisal of management recommendations for communal rangeland in Africa. Although attempts to think through the implications for government policies are still at an early stage, it is clear that they are potentially profound. The case studies presented in the next section provide an opportunity to examine, within a specific context, some of the management and policy issues which these new perspectives suggest are important. These ideas inform analysis of the ecological and technical characteristics of the case study grazing schemes. This summary draws heavily on a recent paper by Behnke and Scoones (1991) which attempts to review the relevant literature.

2.1 The Mainstream Approach

Carrying capacity and succession theory

Classical range management theory and technique, based on research in the USA, has conspicuously failed to have any lasting impact on the ways in which communal rangeland in Africa are used. The problem has generally been conceived by outsiders (both professional range scientists and members of the lay public) as the prevention of degradation through the control of livestock numbers. The basis for this conception has been the notion of carrying capacity, which has provided the standard against which rangeland is judged to be overstocked, overgrazed and degraded.

The concept of rangeland carrying capacity rests on theories of plant succession - the process whereby one community of plants replaces another. Succession theory assumes that a single and persistent vegetation, the climax, dominates a site with a particular soil type and climate. If a climax is disturbed the vegetation is pushed back along the successional sequence, but returns to the climax through a predictable sequence of intermediate stages. In a grazing system this disturbance is provided by grazing animals, and the vegetation is pushed back to some form of sub-climax. The task of the range manager is to balance grazing pressure against the regenerative capacities of the vegetation, maintaining a stable sub-climax which yields a steady flow of animal products. Carrying capacity is the stocking density at which this balance can be achieved.

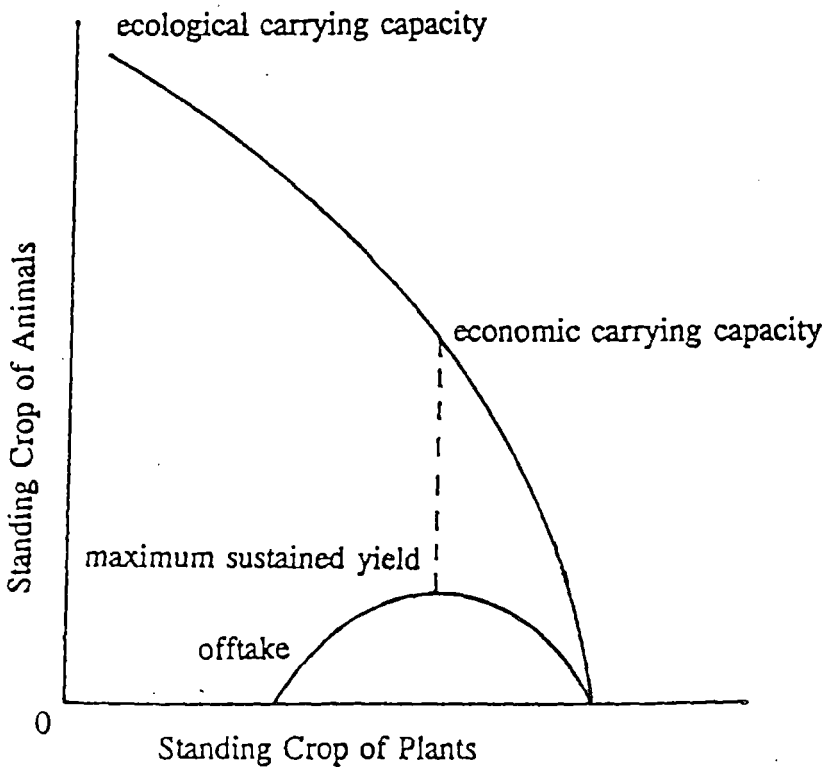
When pushed beyond this threshold of carrying capacity the vegetation of a range deteriorates because its regenerative powers are destroyed, and it regresses back through the successional stages. Experienced range managers can estimate range condition by observing indicator plant species which are sensitive to the effects of grazing. These species increase, decrease or invade a range depending on the intensity of grazing pressure. Vegetation change, it is argued, is an "early warning" of declines in other parts of the grazing system eg. soil loss or livetock production (Stoddart et al 1975: 267).

Ecological and economic carrying capacity

Wildlife biologists (Caughley 1979: Bell 1985) have developed a different approach to the definition of carrying capacity which is useful when applied to communal rangeland. A distinction is drawn between ecological and economic carrying capacity, the concepts marking the relationship between standing crops of plants and of wild herbivores at alternative stocking rates.

As an animal population increases, so the edible plant biomass decreases. Eventually the increase in animal numbers will be checked by the decline in the natural forage; the production of forage will equal its rate of consumption by animals and limited feed supplies will produce death rates equal to birth rates. This equilibrium point is termed "ecological carrying capacity" (Figure 1). Livestock are plentiful but not in good condition, and vegetation is not as dense as it would be in the absence of animals.

Figure 1. The relationship between plant and animal populations in a grazing system



Source: Behnke and Scoones 1991 (adapted from Caughley 1979 and Bell 1985)

If denser vegetation or healthier animals were required then fewer animals could be maintained; in the case of domestic stock culing would have to take place. Different levels of offtake would result in combinations of plant and animal densities other than those found at ecological carrying capacity. The sustainable offtake rate is highest at the stocking density at which the livestock population is growing most quickly, this point usually being at half to two thirds of the stocking density at ecological carrying capacity. This point is what Caughley (1979) has termed "economic carrying capacity".

Different levels of offtake are feasible, depending on the objectives of the manager of the system. For example, if a wildlife manager aims to produce trophy specimens because this is the most profitable system for him, he will require a low density of very healthy animals, well below economic carrying capacity. Abundant vegetation will result. If the manager is operating a game ranching system and aims to produce the maximum number of kgs of meat for sale, then he will require a stocking density that provides the maximum sustained yield of meat - or economic carrying capacity as defined by Caughley. This will result in more animals and less vegetation. If greatest profitability can be derived from game viewing by tourists then the manager will require a relatively dense population of animals, which may be well above economic carrying capacity. This will result in a lower standing crop of plants than in the other two management systems.

Thus there is no single stocking rate which is biologically optimal and which can be defined independently of management objectives. As Bell puts it:

> We conclude, therefore, that the only embracing definition of carrying capacity is: 'That density of animals and plants that allows the manager to get what he wants out of the system'. Thus, any specific definition of carrying capacity must be expressed in relation to a particular objective, and it must be defined very precisely since there are no 'natural' stability points in such interactive systems that act as foci for self-defining concepts (Bell 1985: 153, cited in Behnke and Scoones 1991: pp 5-6).

Thus "overgrazing" and "understocking" must be assessed in terms of the appropriate stocking rate for a specified management system. The same arguments can be applied to grazing systems involving domestic livestock production. Production of high grade beef is analogous to the trophy hunting system, and production for a market in which meat is ungraded to a game ranching system. Subsistence-oriented pastoralism or systems which harvest output in the form of live-animal products such as draught power, milk or transport are similar to the game-viewing system, where a large standing crop of animals is desirable. These producers may be able to sustain stocking densities well above economic and approaching ecological carrying capacity, even though output per individual animal is low.

Mainstream range management developed in close association with beef ranches. Many of the botanical indicators used to assess "carrying capacity" (eg. increasers, decreasers, bush encroachment, ratios of annuals to perennials etc) have implicitly been used to assess economic carrying capacity in a beef production system. This goes some way to explain how stocking rates in some parts of Africa (in the Communal Lands of Zimbabwe, for example) have exceeded "carrying capacity" for many decades. Thus in Zimbabwe officially recommended stocking rates are estimated to be a half to a third of of ecological carrying capacity (Scoones 1990c).

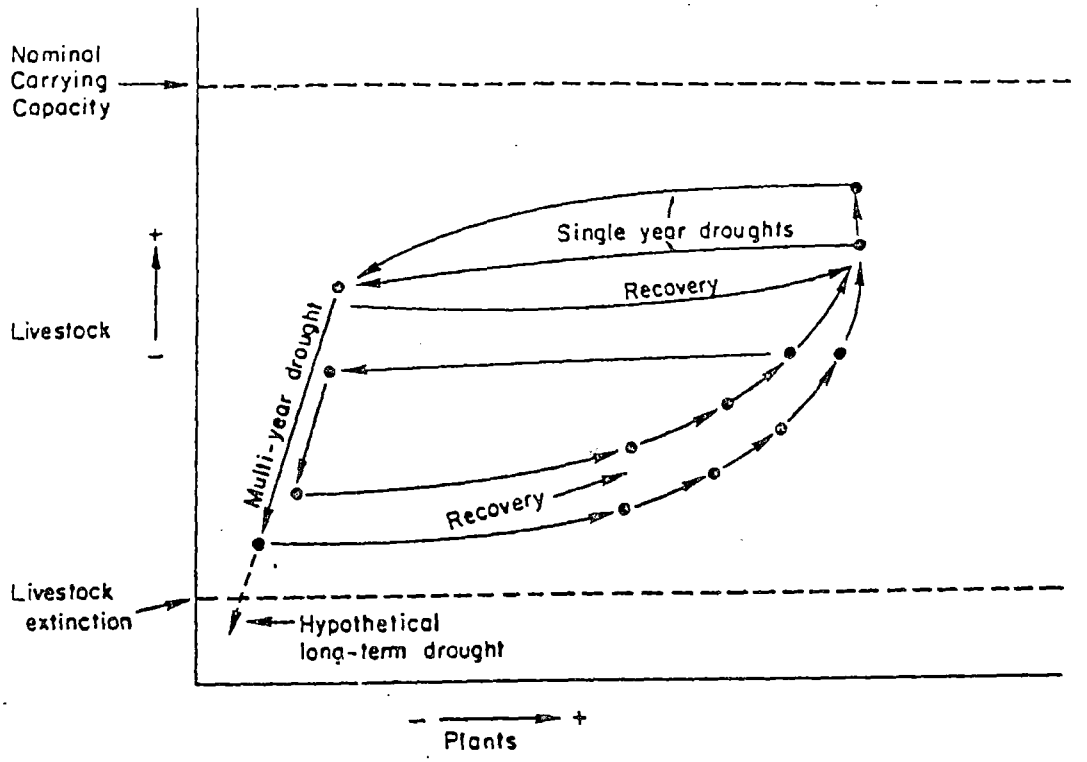
2.2 Non-equilibrium grazing systems

Notions of carrying capacity are based on the idea that animal numbers are controlled through the availability of forage plants and that the availability of forage is controlled by animal numbers - a pattern of negative fedback which produces a stable equilibrium between plant and animal populations. This presumes that conditions for plant growth are relatively constant. But the erratic and highly variable rainfall found in many parts of Africa means that the non-biological variables of moisture and temperature have a greater impact on plant growth than marginal changes in grazing pressure. Thus in areas with fluctuating climatic conditions rainfall, not forage availability, may be the variable which limits animal populations. The underlying pattern may reflect not an equilibrium system but, rather, an event-driven or non-equilibrium system.

Figure 2 shows plant-animal interactions under the influence of frequent droughts in an area with a fluctuating climate - Turkana in Kenya. The simple inverse relationship between plant and animal populations shown in Figure 1 has been replaced by a more complicated pattern.

Figure 2 shows a pattern of plant and animal populations expanding in favourable rainfall conditions, and then contracting under drought conditions of varying degrees of severity. Single year droughts result in relatively small declines in animal populations, but multi-year droughts lead to population crashes. Major droughts occur often enough and herd recovery is slow enough that animal numbers never approach ecological carrying capacity. It is the chance occurrence of non-biological events that determines the condition of the grazing system at any time, rather than the interaction between the biological components of the system (Ellis and Swift 1988).

Figure 2. Plant-animal interactions under the influence of frequent droughts in Turkana



Source: Ellis and Swift 1988, reproduced in Behnke and Scoones 1991

Unpredictable and sudden changes in vegetation are not easily reconciled with conventional theories of plant succession in response to grazing pressure. Recently a "state-and-transition" model of vegetation change has been put forward for rangelands not at equilibrium (Westoby et al 1989). No attempt is made to describe a single successional pathway; a range may move from one state into a number of different states, or return to its original state, and due to factors different to those causing the initial change. Transitions are triggered by natural events such as fire or weather or by management actions (changing the stocking rate, burning, destruction or introduction of plant species, fertilization).

If alterations in state are caused by different combinations of factors, of which grazing pressure is but one, then the effects of a particular stocking rate will be unpredictable unless all the other factors are known. Management of arid rangelands is not a question of maintaining a single, conservative stocking rate, but rather of facing "an oncoming stream of events", and

attempting to "seize the opportunities and evade the hazards, so far as possible", what Westoby et al (1989: 271) call "oportunistic management".

Livestock movement in non-equilibrium systems

If a herd of animals is confined to one place their numbers and productivity are limited by the scarcest resource in the scarcest season in that location. Under equilibrium conditions, where range productivity is reliable and can be controlled to a degree by management, the costs of immobility are relatively slight. Mainstream range management techniques can be used to dampen resource fluctuations within a delimited area: conservative stocking rates provide a "buffer" of surplus forage, fencing and the placing of water points can promote efficient forage consumption, and cultivated pastures offset forage shortages.

In non-equilibrium systems, however, the costs of immobility are much higher. Movement is a means of reducing the stress caused by the wide, unpredictable and largely uncontrollable swings in productivity which characterise these systems. Movements may be regular and seasonal, as in many pastoral production systems involving transhumant cycles, or a highly contingent response to unpredictable events such as localised rainfall deficits, disease outbreaks, borehole breakdowns or fires. Sometimes movement is a combination of regularity and contingency.

In these situations the livestock producer's strategy is to move animals sequentially across a series of environments which reach their peak carrying capacity at different times. Mobile herds can move from ecological zone to zone, avoiding resource-scarce periods and exploiting optimal periods in each area they enter. In this manner they can maintain within a region a total livestock population and level of productivity well above that which could be achieved by confining separate herds to individual areas. Mobility is a widespread characteristic of African pastoralists for a good reason: in non-equilibrium environments herd management must aim to respond to alternating periods of high and low productivity, and exploit ecological heterogeneity rather than attempt to maximise stability and uniformity. What Sandford (1983: 33-36) has called "opportunistic strategies" are rational responses to particular kinds of conditions.

Analysing equilibrium and non-equilibrium dynamics

Case studies of grazing systems have begun to explore the distinction between equilibrium and non-equilibrium dynamics and the importance of animal mobility. In the study in central Turkana in northwestern Kenya referred to above, Ellis and his co-workers found that highly erratic rainfall affected all aspects of the production system (Ellis and Swift 1989). Losses of livestock as a result of drought could drastically reduce herd sizes, but rates of loss were not closely related to stocking rate. With the exception of certain areas with very high stocking rates, how many animals survived a drought was determined more by the length of the dry season than by numbers of animals in the

area before the drought. Livestock movement through emigration and dispersion are also important. Ellis and Swift argue that the climatic patterns of most arid rangelands in Africa mean that these are non-equilibrium, event-driven grazing systems.

Coppock's study of the Borana rangelands of southern Ethiopia, where rainfall is higher and more stable than in Turkana, presents a somewhat different picture (Coppock 1990). He argues that in this environment pastoralists and their herds are important agents of vegetation change, and the fundamental pattern is one of equilibrium. Bush encroachment under heavy grazing pressure leads to the abandonment of sites by pastoralists, but grasses are re-established in the course of a 60-100 year cycle. Bush encroachment is thus part of a potentially sustainable pattern of range use built on spatial flexibility and a human population low enough to permit "fallowing" periods in individual sites.

Scoones (1990c) examined sixty years of livestock population data from southern Zimbabwe and concluded that in runs of good rainfall years cattle populations do approach a ceiling set by ecological carrying capacity. This ceiling is never reached, however, because of the random intervention of exceptionally stressful years when cattle mortality rates are higher than could be predicted on the basis of stocking density. In the long run non-equilibrial dynamics are the major influence on cattle numbers, but equilibrial processes are important in the intervening years; both play a role but at different times.

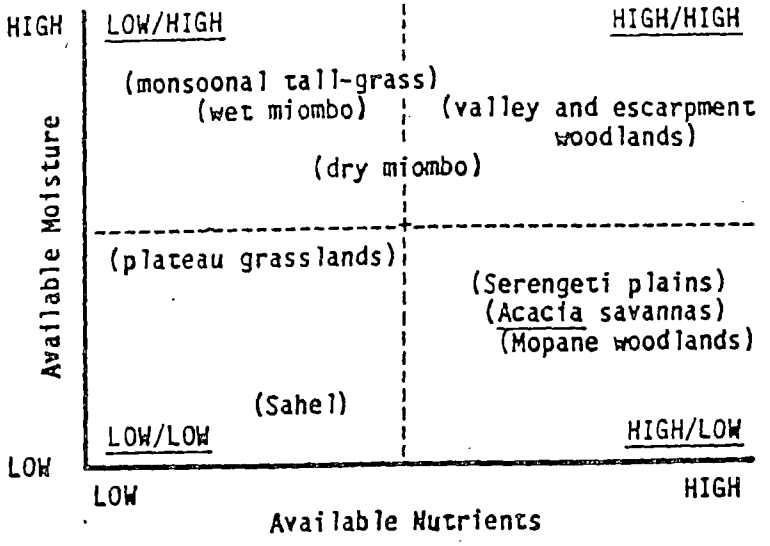
In Zimbabwe high stocking rates are maintained partly by animals exploiting the "patchy" nature of local vegetation which varies with soil differences along drainage systems. In addition to seasonal movements livestock sometimes also migrate across long distances out of their home areas in years of exceptional drought. A pattern described in all three case studies is the exploitation of spatial and temporal heterogeneity by livestock herds and their owners.

2.3 Classifying rangeland types

Range managers need to be able to distinguish between rangelands in which non-equlibrium models are relevant and those in which conventional models involving successional theory and concepts like carrying capacity are appropriate. A classification of rangeland types which reflects emerging perspectives in range ecology is needed.

Analytical classifications of African savanna types have recently begun to emerge which are based on relationships between the independent variables of rainfall and soil type and the dependent variable of animal population (Frost et al 1986). In these various permutations of available soil moisture and soil nutrients are associated with characteristic combinations of savanna vegetation and wild herbivore populations (Figure 3).

Figure 3. Hypothetical distribution of savanna types in relation to the main determinants of savannas



Source: Reproduced from Frost et al. 1986 (modified from Bell 1984)

This classification has potential implications for rangeland management. In southern Africa the distinction between "sweet" and "sour" veld has long been recognised, and in the Sahel there is a similar contrast between water-limited rangeland in the north and nutrient-limited pastures in the wetter south. Behnke and Scoones, following Ellis and Swift (1989) and others, suggest that as rainfall becomes lower and more erratic so the likelihood of non-equilibrium dynamics being observed increases. In wetter areas equilibrium patterns are likely to be more applicable. In areas with both wet and dry periods there may be shifts between equilibrium and non-equilibrium dynamics. Soil type and associated vegetation also have an influence: on heavier clay soils with high nutrient levels primary productivity will be unstable over time due to the infiltration properties of these soils, leading to large fluctuations in livestock population numbers. By contrast, areas with lighter soils will show much more stability.

These differences in rangeland type influence the choice of management intervention: in conditions where equilibrium dynamics are at work the regulation of stock numbers may be appropriate, and in nutrient-poor range types investment in high quality grass or tree species may be worthwhile. On the other hand, in non-equilibrium conditions a management strategy based on opportunistic responses and mobility will be needed, and where

nutrients are not limiting but feed quantity may be a constraint, seasonal fodder biomass shortages could be offset by interventions such as increasing the supply of browse.

Different parts of the landscape may offset particular constraints, and these "key resources" can make available forage of either higher quantity or quality at different times of the year (Scoones 1989b). Patterns of livestock movement are often related to the occurrence of key resources. In the Sahel animals tend to use low quality, high biomass range types in the dry season and high quality, low biomass range types in the wet season (Bremen and de Wit 1982). The identification of key resources may be vital for planning interventions aimed at alleviating constraints and improving range management.

Assessments of degradation processes and risks also need to take these different range types into account[2]. Sandy soil savannaa appear to be more resilient to herbivore impact than heavy soil savannas, where transitions to different, and possibly undesirable, vegetation states appear to be more likely as a result of grazing pressure. Analysis of range degradation must take into account the spatial distribution and topographical location of range types and the interaction between them.

2.4 Opportunistic management

Emerging perspectives in range ecology point to a convergence between scientific theory and techniques of range management practised by African pastoralists. Patterns of land use by these communities are often an effective response to the difficulties posed by an unpredictable natural environment. African pastoralists have had little capacity or need to control localised fluctuations in range productivity; they have, instead, adapted to instablity. High but fluctuating stocking rates and migratory movements of herds seeking forage can be characterised as "opportunistic management". Livestock development requires the refinement and adjustment of these practices, not their suppression or elimination. This conclusion has potentially profound implications for range management policies, which Behnke and Scoones begin to explore (1991: 23-25).

Sandford (1983: 38) has distinguished between a conservative stocking strategy in which "a constant number of livestock graze an area through good years and bad alike" and an opportunistic strategy "in which the number of livestock grazing is continuously adjusted according to the current availability of forage". Conservatism involves a cost - the forage not consumed in good years and the livestock production thereby foregone. Opportunistic stocking rates, on the other hand, present a

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[2] The literature on emerging perspectives in range ecology includes an extensive discussion of the problem of how to assess rangeland degradation. Because of limitations of space this has not been summarised here, but reference can be made to Abel and Blaikie 1989, Biot 1990 and Stafford-Smith and Pickup 1990.

problem of surplus livestock in poor years. Efficient opportunism (Sandford 1983) would not attempt to suppress fluctuations in stock numbers but exploit them by developing mechanisms to quickly and profitably remove excess stock when the rains fail. From this perspective, Behnke and Scoones suggest that aspects of livestock development and range management policies which will need to be re-examined include: livestock marketing, herd movement and land tenure, and pastoral administration (institutional issues).

Livestock marketing

Livestock sales are one means to quickly destock when the need arises. Attention needs to shift from vain attempts to maintain constant levels of sales to the design of marketing systems which can allow for massive fluctuations in levels of throughput.

Herd movement and land tenure

An alternative method of adjusting livestock numbers to forage unavailability is movement. Adapting this feature of pastoralism to changed circumstances will require new approaches to land tenure. In the past tenure reform has concentrated on delimiting areas with clear boundaries and restricting livestock within these, but these have either failed or led to a widespread deterioration of pastoral land rights. Tenure arrangements are needed which combine security with flexibility of patterns of use.

Pastoral administration

Rather than an interventionist but largely ineffective bureaucracy, the non-equilibrium view of range ecology suggests a management model which relies on limited interventions in response to key events, interspersed with long periods of minimal administrative interference. Control over local resources would be devolved to producers and producer groups, and emphasis would shift from the enforcement of regulations to monitoring developments and servicing local needs.

The final section of this report will consider the applicability of these ideas to livestock and grazing management policies in the Communal Lands of Zimbabwe, with particular reference to the lessons to be drawn from the five case studies presented in the following section.

3. CASE STUDIES OF FIVE GRAZING SCHEMES

Conventional grazing schemes involve the investment of considerable amounts of money, labour and other resources such as local supplies of timber. As a result extension officials, staff in local government structures and community leadership groups usually have a vested interest in presenting a positive image of a grazing scheme to visitors and researchers, and it is difficult to discover the reality behind this image. The task is doubly difficult because of the complexities of local political processes and the way that they articulate with development planning and project implementation activities engaged in by external agencies. The advantage of detailed case studies of projects, based on first hand observation over an extended period of time, is that some of this hidden complexity can begin to be laid bare.

This section presents case studies of five Communal Land grazing schemes in different parts of Zimbabwe, and analyses some of their ecological and institutional dynamics. A central focus in the analysis of the ecological characteristics of the schemes is the question of spatial and temporal variability, which emerging perspectives in range ecology suggest is important.

Some of the key ecological and socio-economic features of the schemes are described and compared first, as background to the detailed case studies which follow.

3.1 General characteristics of case study schemes

3.1.1 Selection and research methodologies

These case studies were selected on the basis of the sample survey of 31 schemes carried out in 1987 and 1988 (Cousins 1989). Schemes were classified as "apparently successful" or "apparently unsuccessful", and three of each were selected as case study sites. Three were fenced, two were completely unfenced, and one was beginning to erect fences on a portion of its grazing land. The sites were selected in three different Communal Lands across a range of environmental conditions: two were located in Natural Region IV, two in Natural Region III (but bordering on IV), and two on the border between Natural Regions II and III. Soils and vegetation were notably different in the three areas selected.

One case study could not be carried out for logistical and personnel reasons. The location and fencing status of the five remaining schemes at the time research was initiated are shown in Table 3.1

Both quantitative and qualitative data were collected. Methods used included questionnaire surveys, interviews with key informants, crosschecking of interview data (triangulation), observation of community and committee meetings, participation in community work sessions, cattle following, monitoring the use of grazing areas, and the perusal of local records and documents.

Cattle following data were collected using the same methods used by Scoones in Mazhviwa in 1986 (Scoones 1989) so that results could be compared, and analysed in terms of seasonal patterns of habitat patch use by livestock. Habitat patches were identified, and their areas estimated, from both ground observation and aerial photographs.

Table 3.1 Location and status of case study grazing schemes

Scheme	Communal Land	Natural Region	Fencing status (1989)
(Apparently successful schemes)			
Chamatamba	Mhondoro	II/III	Unfenced (initiating fencing)
Maraire	Zimuto	III/IV	Unfenced
Mangezi	Matibi I	IV	Fenced
(Apparently unsuccessful schemes)			
Mutakwa	Zimuto	III/IV	Fenced
Machingo	Matibi I	IV	Fenced

3.1.2 Ecological and technical characteristics

The individual case studies will describe the ecological features of each scheme in detail; the profiles provided here serve to highlight the diversity of local contexts in which grazing schemes have been implemented.

* Chamatamba (in Region II/III) experiences higher and more reliable rainfall than the other schemes, is located on sandy soils with a high water table, and in the period of the research study contained grass species which were generally unpalatable. There was little environmental heterogeneity at the macro-scale, but a great deal at the micro-scale. There was a high ratio of grazing to arable land, and stocking rates were low. Before 1989 (when three paddocks were constructed) there was little fencing of grazing land, and what there was appeared to play a symbolic role in bolstering the community's image as effective resource managers rather than serving as a grazing management tool.

* The two schemes in Zimuto (in Region III/IV) experience unreliable rains and the sandy soils are of low fertility. At the time of research livestock were dependent on vlei (dambo) land for most wet season grazing since toplands provided very little forage. The environment was extremely

variable within the schemes. Land for cropping was in short supply and there was pressure to cultivate lands which had been left to fallow. In one scheme (Mutakwa) the ratio of grazing to arable land was extremely unfavourable (less than 1), and in the other (Maraire) it was slightly more favourable but still low for the Natural Region; stocking rates were high compared to those officially recommended. Mutakwa had 6 fenced paddocks but none of the grazing land in Maraire was fenced.

* The two schemes in Matibi 1 (in Region IV) are located in an area of unreliable rainfall; soils are mixed and consist of either sandy loams or fertile high level alluviums. At the time of the research study the riverine areas and drainage lines were important sources of forage. Arable land was in short supply within these communities, and the ratio of grazing to arable land was very low given the semi-arid nature of the region. Both schemes had fenced off portions of their grazing land but in neither was fencing of paddocks complete.

Table 3.2 Ratios of arable to grazing land and stocking rates in case study schemes

Scheme	Cham	Mut	Mar	Mang	Mach
Total land area (ha)	2306	640	738	789	705
Non-arable land (ha)	1804	301	428	459	440
Arable: grazing land ratio	1:3.6	1:0.9	1:1.4	1:1.4	1:1.7
Livestock Units (LUs) in 1988	464.6	278.1	202.7	169.4	130.1
Stocking rate - total area (LU:ha)	1:4.9	1:2.3	1:3.6	1:4.7	1:5.4
Stocking rate - non-arable area	1:3.8	1:1.1	1:2.1	1:2.7	1:3.4
Recommended stocking rate	1:2-4	1:6-8	1:6-8	1:8-10	1:8-10

[NB. Abbreviations in this and subsequent tables: Cham = Chamatamba; Mut = Mutakwa; Mar = Maraire; Mang = Mangezi; Mach = Machingo.]

Table 3.2 shows the total and non-arable land areas within community boundaries in 1988/89, the ratio of arable to grazing land, and stocking rates for each scheme, the latter calculated for both total and non-arable land. Officially recommended "rule of thumb" stocking rates for the regions in which the schemes are located are also shown.

Only one scheme, Chamatamba, had a stocking rate close to that which is officially recommended. For the other schemes the high ratios of arable to grazing land shown provide part of the explanation for this: animals were needed to plough the arable land but grazing land to feed these animals was in short supply.

3.1.3 Socio-economic characteristics: some general features of the Communal Lands

Before describing features of the case study communities some of the general characteristics of livelihood systems in the Communal Lands are briefly summarised. The case studies tend to conform to these general patterns, but some variation is also evident.

* The rural population of Zimbabwe is **highly differentiated and heterogeneous**, and many households engage in a wide range of livelihood strategies. Off-farm (and in particular wage remittance) incomes play a significant role in these strategies. Rural incomes are highly skewed, with a small layer of households earning large proportions of total crop, livestock and off-farm income. Both total income and security of income are increased by diversification of sources of income (Jackson et al 1987; Weiner and Harris 1989).

* There is a **strong degree of inter-relatedness between the cropping and livestock components of the basic farming system** found in the Communal Lands. This is because of the importance of draught power provision through animal traction; the value of manure for improving crop yields on poor sandy soils; the fact that crop residues constitute a major source of dry season feed for livestock; the use of draught animals for the transport of manure and fertilizer to fields and for the transport of harvested crops from fields; and the multi-purpose role of goats in the agropastoral system (FSRU 1985; GFA 1987). An essential component of this agropastoral farming system is extensive grazing, the source of the bulk of livestock feed. Cliffe (1988) has characterised the overall system as Arable Plot - Ox Plough - Communal Grazing (or AP-OP-CG), and this neatly summarises its integrated nature.

* Communal Land cattle are not produced for sale as beef animals, but rather to **fulfill a number of different functions**: in providing inputs to arable production, as a source of milk and transport, and as an asset for income security (Danckwerts nd; GFA 1987; Scoones and Wilson 1989). Estimates of livestock productivity and valuation of output have to be determined by household objectives, not by measures derived from a completely different production system. Estimates using replacement cost methods have consistently valued the output of Communal Land livestock systems as higher than that of commercial beef ranching enterprises (ARDA 1987; Scoones 1990a; Barrett 1991).

* The explanation for the generally low offtake rates in Communal Lands (2 to 8 percent as compared to rates of between 16 percent and 26 percent in the large scale commercial sector) is to be found partly in the multiple-function nature of cattle herds and the relatively high rate of return to investments in cattle, and partly in the distribution of cattle among the population. In 1985/6 about 70 percent of Communal Land households owned less than 6 head of cattle (CSO 1986). Sandford (1982) estimated that the minimum herd size required to sustainably reproduce a draught team of two oxen is ten head of cattle, and a team of 4 oxen may be required to plough early in the wet season (FSRU 1985: 33). The vast bulk of households are not, therefore, interested in selling cattle except in case of emergencies (to raise cash for school fees, for example, or in a drought year), and are much more interested in acquiring cattle and increasing herd size.

3.1.4 Socio-economic characteristics of case study schemes

Demographic features (Table 3.3)

In 1988 the proportion of female-headed households[3] in Machingo was particularly low. In Mangezi, however, it was higher than in the other cases; most of these were older widows with male relatives in the community. Three communities had high rates of labour migration (nearly two thirds of households contained wage workers) and two had rates which were much lower (close to one third of households had wage workers within them).

Table 3.3 Demographic features of case study schemes

	Cham	Mut	Mar	Mang	Mach
n	120	99	61	68	50
Mean Household size	6.4	6.7	6.1	6.6	7.5
Mean age of household head	49.0	48.2	50.1	43.8	41.7
% female headed households	17.5	19.0	19.6	27.9	10.0
% households with wage workers	36.7	63.3	62.3	30.9	60.0

[3] Female-headed households are defined as those headed by widows, divorcees or single women.

Crop production (Table 3.4)

Chamatamba in Mhondoro Communal Land is located on the boundary between Natural Regions II and III and has a reasonably high potential for cropping. Grain production in 1988 was highly skewed - the mean amount produced per household was 2106 kg but 50 percent of households produced 1210 kg or less. A similar pattern of skewedness was apparent with regard to grain sales.

The two schemes in Zimuto (Mutakwa and Maraire) are on the boundary between Regions III and IV, but in 1988 many crops in this Communal Land were grown in wetland (vlei or dambo) fields. The range of different crops grown in the Zimuto schemes (5.4 and 5.5) was much higher than in the other areas, and commonly included finger millet (rapoko) for brewing purposes, and rice, intercropped with maize in vlei fields. In both schemes grain sales were somewhat skewed, with the median figure less than half of the mean.

Mangezi and Machingo are located in Region IV where cropping potential is generally poor. In 1988 the range of crops grown was small, particularly in Mangezi, but included a higher proportion of drought-resistant small grains than was the case in the other areas.

Table 3.4 Crop production in case study schemes

	Cham	Mat	Mar	Mang	Mach
n	42	43	29	27	25
Number of crop types grown - mean	3.1	5.4	5.5	2.7	3.4
Mean grain production per household in kg	2106	1960	2475	679	1498
Median	1210	1550	2610	360	980
Mean legume production per household in kg	169	153	187	40	241
Median	90	135	135	0	0
Mean grain sales per household in kg	1104	652	731	78	213
Median	540	270	360	0	0

Cattle herd structures and offtake rates (Table 3.5)

In 1988 the structure of the "community herd" in Chamatamba, Mutakwa and Maraire was typical of draught-oriented cattle herds: there were high proportions of oxen and cows (both in the order of 30 percent of the herd). In Mangezi and Machingo the proportion of oxen (and male animals in general) was much lower, and the proportion of female animals (cows and heifers) much higher. The herd structure was similar to that found in Mazvhiwa (also in Natural Region IV) in 1987 by Scoones (1990: p26), who ascribes the high proportion of females to the need to rebuild draught-oriented herds after drought. It may be, however, that in the drier regions, where cropping is more risky, livestock play a greater role in contributing directly to household livelihood (through milk and cash sales), and that more female animals are kept as a result.

The generally low offtake rates for the five herds were broadly similar to those for Communal Land herds in general (CSC 1988: 12) and confirm that these were not commercial, beef-oriented herds. Higher offtake from sales as opposed to slaughters in Mangezi and Machingo may reflect the greater direct dependence on livestock production hypothesised above. The numbers involved, however, were very small (12 sales in Mangezi and 13 in Machingo).

Table 3.5 Cattle herd structure and offtake rate in case study schemes

	Cham	Mut	Mar	Mang	Mach
Community herd size (1987)	748	413	293	207	164
Community herd structure (%)					
Bulls	3.1	6.1	3.1	1.9	6.7
Oxen	29.4	27.4	31.7	16.4	16.9
Steers	6.9	8.4	4.8	4.8	3.7
Cows	34.6	30.5	33.8	36.2	34.1
Heifers	9.0	9.2	9.5	20.3	17.7
Calves	17.0	18.4	17.1	20.3	18.9
Offtake rate (%)	5.5	7.3	5.5	5.8	9.1
- sales	2.4	1.5	2.7	5.8	7.9
- slaughter	2.7	4.9	2.8	0	0
- other (eg roora)	0.4	0.9	0	0	1.2

Cattle ownership[4] (Table 3.6)

The distribution of cattle holdings within these communities in 1988 displayed the highly skewed pattern characteristic of the Communal Lands (Jackson 1989; Chipika 1989), but with significant differences. In Chamatamba over a quarter of households held 10 or more cattle, but in Mangezi these large herd owners comprised only 10 percent of the community. In Mangezi and Machingo 50 percent or more households were non-cattle owners; in the other schemes non-owners comprised between 33 and 40 percent of the total.

Table 3.6 Cattle ownership in case study schemes

	Cham	Mut	Mar	Mang	Mach
n	120	99	61	68	50
Household holdings (%)					
0 cattle	40.8	40.4	32.8	50.0	54.0
1-9 cattle	33.4	45.5	49.2	39.7	32.0
10 or more cattle	25.8	14.1	18.0	10.3	14.0
Mean cattle holdings - all households	6.2	4.2	4.8	3.0	3.3
Mean cattle holdings - owners only	10.5	7.0	7.1	6.1	7.1

Sources of draught power (Table 3.7)

Very few crop producers in the schemes used a source of draught power other than cattle, and this meant that the large numbers of non-cattle owners either borrowed or hired cattle from other households. Households without sufficient draught animals to make up a ploughing team also mostly borrowed or hired. Borrowing was far more common than hiring in four of the schemes - only in Mutakwa was this relationship reversed, and here a common form of payment was labour on the fields of the cattle owner. In all cases most borrowing was from patrilineal relatives within the community. There was thus a great degree of interdependence

[4] "Ownership" here refers to cattle held in a household's kraal and available for household use, whoever the legal owners of the cattle are; it is thus synonomous with "holdings" in these tables. For a discussion of the difficulties of defining ownership in unambiguous terms, see Scoones and Wilson 1989: pp 61-65.

between households within grazing schemes in respect of one of the most important functions of cattle - the provision of draught power.

Table 3.7 Sources of draught power in case study schemes

	Cham	Mut	Mar	Mang	Mach
n	120	99	61	68	50
Source of draught power (%)					
Own cattle	48.3	43.4	37.7	36.8	34.0
Borrowed cattle	35.8	19.2	27.9	32.4	38.0
Hired cattle	13.4	21.2	14.8	11.7	8.0
Other sources (eg tractor)	1.6	4.1	9.8	7.4	10.0
No crops planted	0.8	12.1	9.8	11.7	10.0

Summary of socio-economic features

Households within the five case study grazing schemes were generally involved in a number of different economic activities, but the most important for cash income were wage labour and crop production. Cattle did not generate a cash income directly to many households and instead provided inputs to cropping and some subsistence products such as milk and occasional slaughters. Both crop production and cattle ownership tended to be highly skewed in their distribution, although there were differences in the extent of this between schemes. In all schemes there was a high degree of interdependence between households in respect of draught power.

3.2 CHAMATAMBA GRAZING SCHEME

During the 1980s Chamatamba grazing scheme was widely regarded as a rural development "success story". The scheme won several provincial conservation competitions, won the national conservation prize in 1987, and received a great deal of publicity in the national press. Until 1989 no donor funding had been received for fencing purposes, and Chamatamba was perceived as a well-organised and cohesive community and a rare example of a completely self-financed grazing scheme. On closer inspection, however, the reality of common property management in Chamatamba proved to be much more complex.

3.2.1. Ecological and technical characteristics

Climate, soils and vegetation

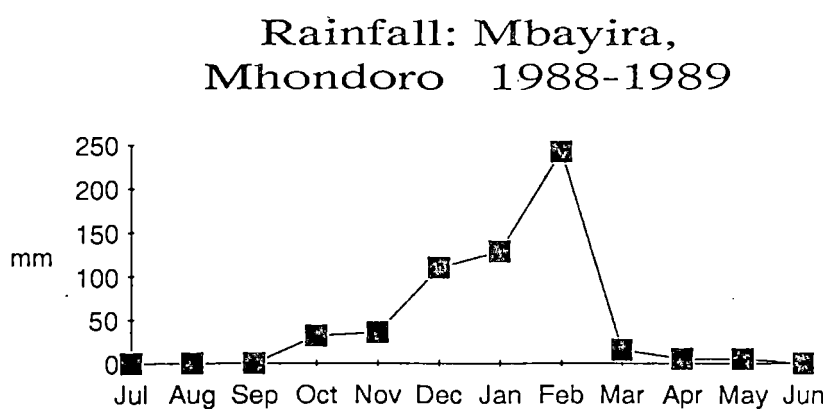
Mhondoro Communal Land is situated some 60 kms south of Harare, and straddles the boundary between Natural Regions II and III. Average rainfall at the centrally located Mbayira station for the decade 1980/81 to 1989/90 was 676.4 mm. In only one year (1986/87) was rainfall less than 500mm (see Figure 4). Rainfall for the years 1988/89 and 1989/90 is also shown in Figure 4.

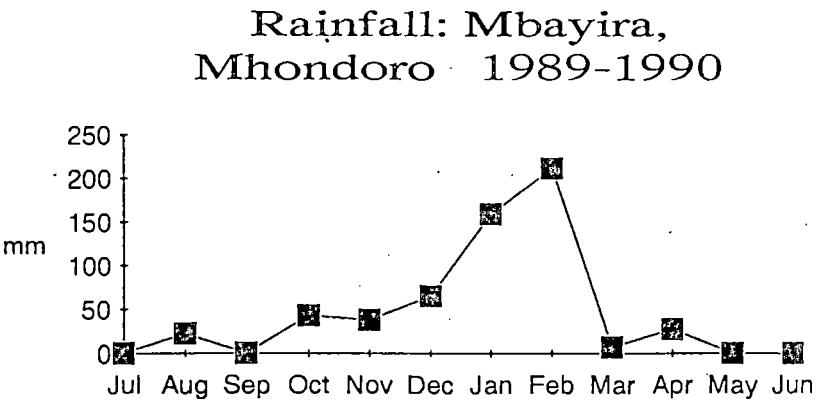
In the part of Mhondoro where Chamatamba is located the soils are generally sandy, derived from slightly gneissic rocks juxtaposed onto grits and sandstones of the Karoo Formation. The water table is high, lying at 1m below the surface in summer and 2m deep in winter.

The characteristic vegetation for the region is woodland dominated by Brachystegia spiciformis (msasa) and Julbernadia globiflora (mnondo), underlain by a grass cover composed of tall "sour" species and dominated by Hyparrhenia spp. (Vincent and Thomas 1962: 57-58). Because of the high water table the "Parinari open woodland" subtype is dominant in the Chamatamba area. In the 1980s the dominant tree species was Parinari curatellifolia (muhacha) which is evergreen, has a high requirement for moisture, and can tolerate seasonally wet soil conditions. Another common tree was Strychnos spinosa (matamba), the source of an edible fruit, and the species which gave the grazing scheme its name. A common grass species, highly unpalatable and largely unutilised by livestock, was Schizachyrium jeffreysii. Hyparrhenia grass spp were also common, as were a number of sour grass species such as Hyperthelia dissoluta, Loudetia simplex and Aristida spp.

This "Parinari open woodland" was found in the central topland area of Chamatamba, between the two lines of settlement (see Figure 5). Another vegetational subtype, similar to the "plateau grassland" described by Vincent and Thomas (1962: 58), was found between the lines of settlement and the two rivers which form the north eastern and south western boundaries of the scheme. Soils were very sandy and pallid and deeper than in the central area, and pedestalling of tussocks in some areas indicated a degree of

Figure 4. Rainfall at Mbayira, Mhondoro





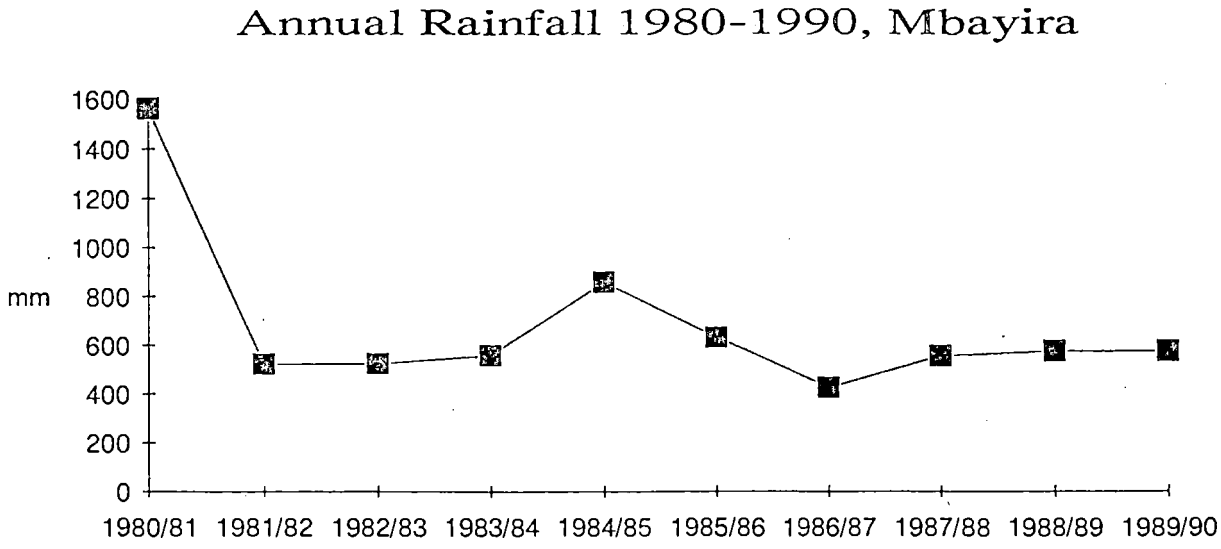
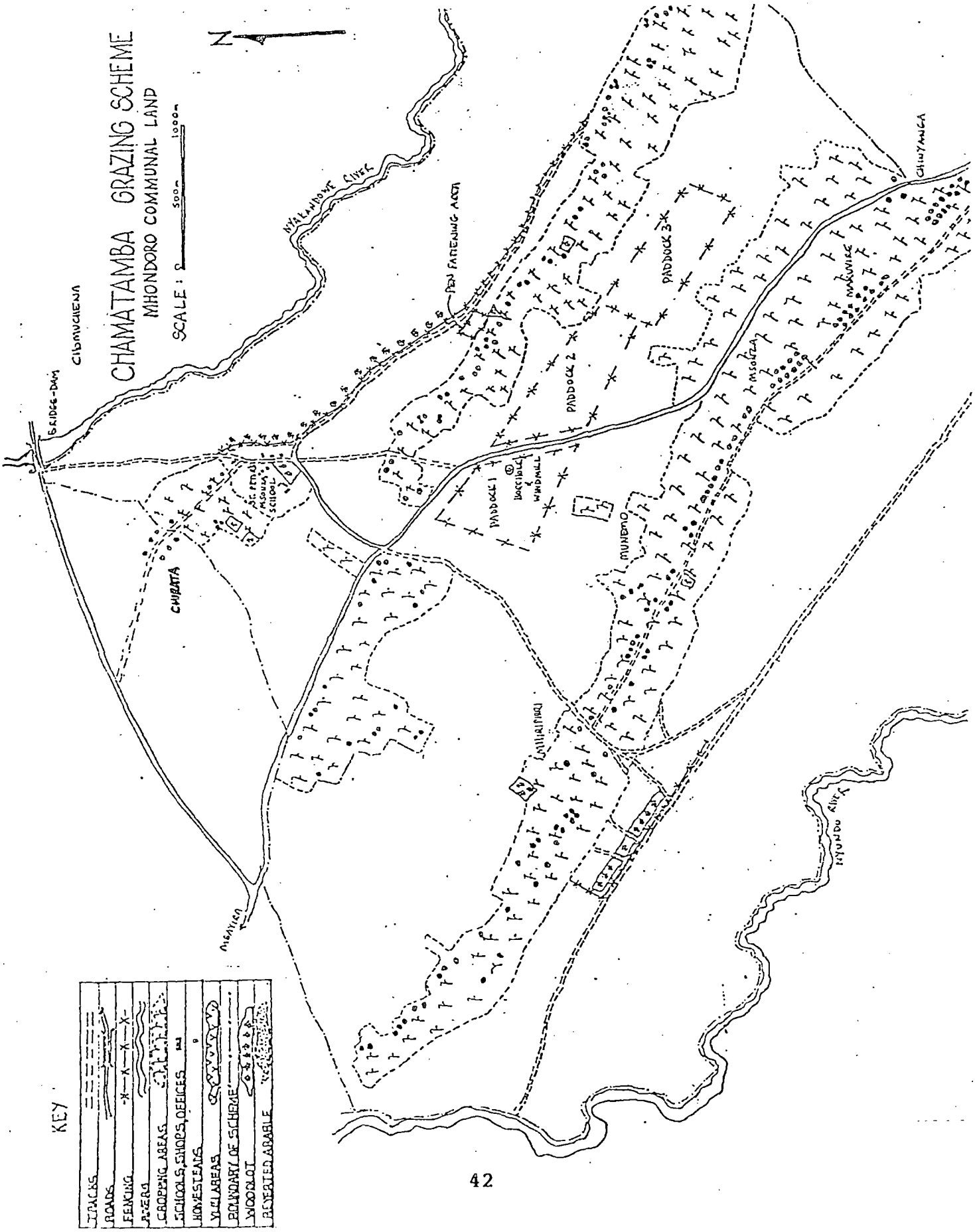


Figure 5. Land use in Chamatamba grazing scheme



sheet erosion. Here the height of the water table militated against tall tree species and sour grasses of poor grazing value predominated (Schizachyrium jeffreysii, Loudetia simplex, Melinis repens, Trachypogon spicatus, and Elynorus argenteus). The most common tree species, found in those areas with deeper soils, was Terminalia sericea (msusu). Low-growing woody plants found in these areas included Syzygium huillense and Parinari capensis.

A notable feature of these open grasslands was the large number of termite mounds, colonised by Cynodon dactylon (couch grass), which is palatable and hence heavily grazed. Heteropogon contortus (spear grass) was found on and adjacent to mounds and was also heavily grazed. Woody plants (eg. Albizia amara, Diospyros lycioides, Peltophorum africanum, Ziziphus micronata) were found on some of these termite mounds, and some were browsed by livestock.

Habitat patches and land use

The pattern of land use and the incidence of habitat patches in Chamatamba during the study period are shown in Figure 5 and Table 3.8. The community which had adopted the grazing scheme consisted of five villages (kraals), which were located in two lines of settlement and cultivation running north west to south east. The kraals were named after the ruling lineage in each cluster of settlement: Mhiriphiri, Munemo, Musonza, Makuvire and Chinyanga. The Nyundo and Nyakandowe Rivers demarcated the south western and north eastern boundaries of the scheme.

Table 3.8 Habitat patches available for grazing within Chamatamba grazing scheme in different seasons

	Wet season (ha)	%	Dry season (ha)	%
Fallow fields	150	7.7	-	-
Fields[1]	0	0	467	20.3
Open grazing	1049	53.8	1049	45.6
Central grazing	656	33.7	656	28.5
Homesites, kraals and pens	35	1.8	70	3.0
Riverine (Woodlots)[2]	58	3.0	58 (6)	2.5
Total	1948		2306	

[1] "Fields" in the dry season included both cultivated and fallowed land.
[2] Small fenced woodlots were scattered throughout the scheme and were not available for grazing.

There were three recognised grazing areas in Chamatamba: the central grazing area between the two lines of settlement (656 ha), and the two "open grasslands" running down to the rivers (together comprising 1049 ha). In 1989/90 the central area became the site of three fenced paddocks, enclosing an area of perhaps 150 to 180 ha. It is estimated that in 1988 about 467 ha, or 20 percent of the total land area, were under cultivation in Chamatamba. The fields were generally located in the vicinity of the homesteads, at the edges of the central topland zone.

The most important contrasts in habitat type were: (a) between the central grazing area, which contained scattered tall trees, and the open grasslands, which did not, and in which scattered termite mounds were found (ie. between the two subtypes identified by Vincent and Thomas); (b) between both of these grassland habitats and the riverine areas adjoining the Nyundo and Nyakandowe Rivers. This was a narrow zone, estimated to be 58 ha in extent, which contained a greater density of trees and shrubs than the grasslands and which sustained a green sward of grass until late in the dry season. In general there was not as much environmental heterogeneity at the macro-scale as in the other case study grazing schemes.

As Table 3.7 shows, the ratio of grazing to arable land in Chamatamba was extremely favourable in comparison to the other case study grazing schemes, and the stocking rate was much lower than on most Communal Land grazing.

The grazing scheme

In the 1950s extension staff introduced a system of deferred grazing in Mhondoro Reserve. In theory this involved the rotational rest of a "paddock" (reserved area) for a full grazing season, but in Mhondoro the practice was often to merely assign an area as winter grazing, and to use it to grow thatching grass in the summer months. Extension officers regarded this allocation of a winter reserve by communities as an "encouraging result" of their efforts to promote grazing management (Shepherd pers.comm.).

In Chamatamba two lines of settlement had been established by the 1960s, and the area reserved for winter grazing was the central grazing between the two lines. This "winter reserve" system survived through to the 1980s, and was what was known as "the grazing scheme" when the first provincial Conservation Competition was won in 1985.

Grazing management in Chamatamba in recent years has consisted largely of occasional attempts to enforce the rule which defers grazing in the central area until the dry season. The apparent success of this system, as evidenced by the tall stands of grass in the central area, resulted in Chamatamba winning three Natural Resources Board (NRB) Conservation Competitions, in 1985, 1986 (provincial prize winner) and 1987 (national prize winner). As in the heyday of grazing scheme extension in the early 1970s (Froude 1974), bundles of barbed wire were included in the prizes

for these competitions. These were then used to begin the construction of fenced paddocks in the summer grazing areas.

Figure 5 shows the location of two lines of fencing which were erected using the wire won in the competitions. One line ran southeast from St. Peter's Msonza school, close to the second line of homesteads and fields, and separated the Nyakandowe summer grazing area from this line of settlement and cultivation. The other ran south east for a short distance parallel to the first line of settlement, in the Nyundo summer grazing area.

According to the grazing scheme committee which was responsible for resource management in Chamatamba these lines of fencing were intended to serve two functions: to prevent animals from the community's own herds straying into the central grazing during the summer (ie. as an aid to herding during the wet season), and to reduce the problem of unherded animals from neighbouring communities "poaching" Chamatamba grazing and causing damage to crops. The fences were often referred to as "the boundary wire".

The committee's long term plan, developed with the aid of the Agritex Extension Worker, was to construct a series of paddocks in both summer grazing areas. If the problem of water supplies in the central area could be overcome then parts of the winter grazing in the central area could also be fenced into paddocks. Some paddocks were to be planted with improved pasture grasses, pen fattening of animals was to be undertaken, and Short Duration Grazing would be practised.

From at least the mid-1980s, however, the "grazing scheme" in Chamatamba was portrayed by the energetic committee as being much more than lines of fencing and a potential paddocking system. The "scheme" denoted, rather, an ambitious resource development programme which included woodlots, fruit orchards, water development, wildlife management, and livestock production projects.

In late 1987 the committee articulated their vision of the spatial form of the scheme as a series of concentric zones around the central grazing area. The outermost ring would consist of paddocks of summer grazing, separated from an inner ring of planted pasture grasses by a belt of gumtrees. These pastures would provide the fodder for intensive raising of beef cattle or dairy cows, and improved bulls for upgrading the local herds would be kept here as well. Community fruit orchards would also be located in this zone. Homesteads and arable lands would remain in their present location. The central area would be developed as a winter grazing reserve with a pumped water supply, which could also serve community vegetable gardening projects. The small buck (mene, or duiker) still living in the thickly grassed central grazing would be conserved by the strict control of hunting. Fish would be introduced into the bridge-dam at Chomuchena and fishing controlled by means of a licensing system.

Between late 1987 and late 1990 some components of this ambitious plan were implemented. Gumtrees and a fruit orchard were planted,

pen fattening projects were carried out, and a borehole was sunk in the central grazing area using donor funds from the Beit Trust. A pure Mashona bull donated by one of the judges in the NRB conservation competition began to be used for stock improvement. A windmill was also purchased with part of this donation. Fencing materials were donated by the District Administrator and three paddocks were constructed in the central zone.

Despite Chamatamba's reputation as a community displaying a high level of commitment to resource management, however, participation in these activities was limited to a minority of households, and intra-community tensions arose. Grazing management was limited, and upkeep of the first lines of fencing was problematic. Between August 1988 and November 1990 the two lines of fencing were in a extremely poor state, and in places had completely collapsed. By late 1990 the three fenced paddocks were being used only sporadically, and the windmill was not yet in place.

Patch use by livestock

Habitat patch use by foraging cattle herds during the period January to December 1989 was investigated using similar methods to those employed by Scoones (1989) in Mazvihwa Communal Land. Two herds of cattle (numbering 13 and 26 respectively) were selected for cattle following, one from each of the two lines of settlement, and therefore tending to graze in different summer grazing areas. The herds were followed for a full day each month, and habitat patch and foraging activity were noted at half hour intervals.

The owner of the larger of the two herds was a wealthy farmer who was also employed in an urban area, and he regularly provided purchased supplementary feeds to his cattle in the cattle kraal or in a small fenced pen in the grazing area. The second herd owner fed his cattle in their kraal with maize stover only. Except for time spent feeding in the kraal or pen the data from the two herds display similar seasonal trends and have therefore been aggregated. Habitat patch use was analysed using these aggregated data (Table 3.9).

Table 3.9 Seasonal habitat patch use in Chamatamba, 1989 (expressed as a percentage of total feeding time)

	Cropping	Early dry	Late dry
Fallow fields	6.7	-	-
Fields	-	11.0	15.0
Open grasslands	42.1	32.3	21.0
Central grazing	9.3	13.7	26.0
Home sites, kraals, pens	25.3	20.0	16.0
Riverine	16.6	23.0	22.0

This analysis shows clearly that cattle herds did not follow the deferred grazing system. The central grazing area was used for nearly ten percent of the time in the wet season, and never for more than 26 percent of total feeding time even in the late dry season. The open grasslands were used for nearly a third of feeding time in the early dry season, and for a significant proportion of time even in the late dry season.

Given their small area, surprisingly large proportions of feeding time were spent in home sites, kraals and pens, on the one hand, and in the riverine zone, on the other. The foraging preference index calculated for the different habitat patches, shown in Table 3.10, highlights this pattern. In the case of the former this is partly explained by the supplementary feeding practised by the herd owners. In the case of the riverine zone a major reason is undoubtedly the need for stock to water at least once a day, but the presence of green grass and some browse throughout most of the dry season is probably also important.

Table 3.10 Foraging preference index[5], Chamatamba 1989

	Cropping	Early dry	Late dry
Fallow fields	0.87	-	-
Fields	-	0.54	0.74
Open grasslands	0.78	0.71	0.46
Central grazing	0.27	0.48	0.91
Home sites, kraals, pens	14.0	6.67	5.33
Riverine	5.53	9.2	8.8

One notable feature of habitat use is not reflected in these data. This is the considerable amount of time cattle spent grazing couch grass (Cynodon dactylon) and spear grass (Heteropogon contortus) growing on the termite mounds scattered throughout the open grasslands, and found to a lesser extent in the central grazing area as well. Unfortunately the proportion of feeding time spent in this manner cannot be reliably estimated due to the unsystematic nature of these observations, but its importance was confirmed in discussions with cattle owners and herders, and by visiting ecologists. Frost (pers. comm.) is of the opinion that the termitaries constituted "patches" of higher quality grazing (possibly containing higher levels of protein) and thus functioned as "key resources" within an environment which was otherwise fairly homogeneous and provided only poor quality grazing.

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[5] The preference index was calculated as:

$$PI = \frac{\%\text{ feeding time spent in habitat patch x in season y}}{\%\text{ of area available as habitat patch x in season y}}$$

The pattern of use of forage resources in Chamatamba differed from those found in the vlei-based systems of Zimuto or in the sandveld/clayveld dual-zone system in Mazvhiwa described by Scoones (1989; 1990). Spatial heterogeneity was less significant, but was still apparent in the use made of the "key resource" of the riverine zone, which was more heavily used in the dry season than in the summer months, and in the grazing of couch grass on termite mounds, which were found in higher numbers in the "open grasslands".

The deferred grazing system practised in the central grazing area, although not strictly adhered to by Chamatamba's cattle owners, was partly responsible for a marked contrast between the condition of this area and that of the two open grasslands. The central area was covered by a mixture of tall thatching grasses (Hyparrhenia spp), tussocks of Schizachyrium jefferysii and other sour grasses, and a profusion of Kotschya strobiliformis bushes. There was a great deal of moribund material and large tufts of grass tending to die back in winter were common. Although the (apparently) impressive stands of grass had resulted in Chamatamba becoming a prize-winning grazing scheme, the condition of rangeland in this area suggested to visiting ecologists in mid-1989 a degree of underutilisation (Maclaurin pers. comm.; Frost pers, comm.). The open grassland areas were clearly more heavily utilised, perhaps partly because of the greater abundance of termite mounds.

3.2.2 Socio-economic differentiation

Some of the important socio-economic features of Chamatamba at the time of the study have been referred to in section 3.1 above. This section discusses the pattern of differentiation between households.

Both grain production and grain sales in Chamatamba were highly skewed (see Table 3.11). The top 24 percent of households accounted for 81.5 percent of all the maize sold in 1987/88. Half of the households in Chamatamba sold no maize at all.

Table 3.11 Maize hectarage, maize sales and cattle ownership in Chamatamba 1987/1988

	Cattle ownership			
	0 cattle (n=49)	1-9 cattle (n=39)	10 or > cattle (n=32)	ETA
Hectares under maize (mean)	1.1	1.3	2.1	0.41
Maize sales in bags (mean)	2.2	8.4	23.2	0.54

Cattle ownership was also highly skewed in Chamatamba (see Table 3.5 above), and large herd owners in 1987 held 74 percent of all cattle while comprising only 26 percent of all households. The level of cattle ownership of households was fairly strongly associated with crop production characteristics. In the stratified sample survey the mean grain production of large herd owners was over 4 tonnes, as compared to under 2 tonnes for medium herd owners and less than 1 tonne for non-owners. Table 3.11 shows that cattle holdings and maize sales were fairly strongly correlated, and that large herd owners in 1987/88 sold on average nearly three times more maize than medium herd owners and over ten times the maize sold by non-owners.

Cattle ownership was more strongly correlated with these variables than was the presence of wage workers in households or the gender of the household head. In Chamatamba a wealthy rural elite made up of older households, and generally headed by males but not exclusively so, owned most of the cattle in the community and dominated surplus crop production. Some of this elite were engaged in wage labour in urban areas and returned home at regular intervals, others were either retired workers or worked locally as teachers, builders or traditional healers.

3.2.3 Institutional arrangements and power relations

The grazing scheme committee

Between 1987 and 1990 visitors to Chamatamba were welcomed and given guided tours around the scheme by members of the grazing scheme committee. One version of the committee's composition stated that each of the five kraals within Chamatamba was represented by two committee members; another had it that each kraal was represented by its sabhuku (kraalhead) and his "assistant". In reality, however, the committee included four members of Munemo kraal and only one from Msonza. Members included masabhuku from three kraals and acting masabhuku (younger brothers of aged and inactive incumbents) from the other two kraals.

The first elections for the committee were held either in 1982, or in 1985 when the scheme first decided to enter the provincial conservation competition (informants gave contradictory information on this question). No elections had been held since at least 1985.

The committee combined two sources of legitimate authority: the "traditional" leadership role of the masabhuku, and some notion of representative democracy involving election by members and accountability to them. It was the only local institution with recognised authority over common property resources in Chamatamba.

The VIDCO

Four of Chamatamba's kraals fell within VIDCO 7, and the fifth, Chinyanga, fell within a neighbouring Ward and thus a different VIDCO. This was said to be not problematic by community leaders "because we have been together a long time", (implying that continued co-operation was not threatened). Perhaps a more important underlying reason was that VIDCO 7 was largely inactive, had no projects of its own and was generally characterised as "not working".

One possible reason for the lack of interest in the VIDCO was the fact that the grazing scheme committee in Chamatamba had assumed responsibility for all the development planning functions of a VIDCO. It was seen by community members as having responsibility for agricultural projects in general, water and sanitation programmes, the development of infrastructure such as roads and bridges (through representations to the District Council), and approaches to donors for financial assistance.

Grazing scheme by-laws

There was no formal, written set of grazing by-laws in Chamatamba. In February 1987 the Chairman of the committee said that a "constitution" for the scheme existed which defined membership in terms of residence within one of the five kraals, stated that all members had to attend work parties and pay agreed cash contributions, and barred non-members from bringing their cattle into the scheme. Other informants interviewed in 1989 and 1990, including committee members, said that they believed a constitution might exist but that they had never actually seen it.

There was widespread agreement within Chamatamba that a rule existed prohibiting the use of the winter reserve in the central area during the summer months, thus allowing a deferred grazing system to be practised. In a sense this rule "constituted" the grazing management scheme in that it was the only management practice being followed to any degree.

Informants expressed very different views on the issue of what sanctions could be used to enforce this deferred grazing rule. Some stated that fines of between $5 and $10 per head of stock per day had been agreed, others asserted that these amounts applied to herds and not individual animals, and yet others said that no fining system existed at all. No fines were observed or reported to be imposed between August 1988 and November 1990, despite numerous instances of cattle grazing in the central area. By the end of 1990 no additional by-laws had been introduced to govern the use of the new fenced paddocks in the central grazing area.

Other projects

All of the development projects undertaken in the years following independence were carried out in the name of Chamatamba grazing

scheme. Some of these were unambiguously social in character, benefitting all residents - the best example being the bridge-dam at Chomuchena which resulted in greatly improved road access to the area. Others, such as the initiation of fencing lines between summer and winter grazing areas or the planting of community "woodlots" (lines of gumtrees) along this fencing, were accepted by most local residents as being community-oriented, and yielding collective benefits. Another project of this type initiated in 1989 was the planning of village fruit orchards.

A third type of project, however, involved the use of community resources for private income-generating enterprises, and the use of the name and reputation of the grazing scheme to solicit government support. The pen-fattening scheme which was operated in Chamatamba between September 1987 and May 1989 was of this nature. Some of the fencing wire won in conservation competitions was used to construct small paddocks for pen-fattening purposes, and Agritex supplied free feed concentrates to encourage cattle owners to engage in the project. To visitors this was often presented as a "community project", aimed at raising funds for the fencing of communal grazing paddocks. Local residents, however, understood that pen-fattening was being undertaken by a small group of cattle-owners who could afford to either purchase cattle locally for feeding purposes or could feed up some of their own cattle. The project was open to anyone willing and able to participate, but benefits were identified as unambiguously private in character.

A project with a somewhat different character was the agricultural supply co-operative. This was registered in the name of the grazing scheme, and its members requested support from the District Council on the basis that it was a community project. The co-operative was set up in 1988 with 15 members, 5 of whom were also members of the grazing scheme committee. The chairman of both bodies was a local schoolteacher, Mr Frederick Mhiriphiri, who helped to develop a close relationship between the grazing scheme, the co-operative and St. Peter's Msonza School. The school became the unofficial "headquarters" of the scheme and its storerooms were used by the co-operative. The co-op included 5 members from Chirata kraal (supposedly outside Chamatamba), but none from Chinyanga kraal.

The co-op used its starting capital to open a credit facility with a fertilizer company and bought 9 tonnes of fertilizer at a bulk discount. These were then sold locally at a mark-up of $2.00 per bag. By the end of the 1988/89 season over 25 tonnes of fertilizer and over 50 bags of hybrid maize seed had been sold, and the co-op had shown a profit of over Z$ 2000.00. The following season the co-op again traded in fertilizer and seed, and moved into the cement business.

In mid-1988 a typed constitution for the cooperative was drafted, with the help of the headmaster of the school, so that the co-op could be registered with the Ministry of Community Development, Women's Affairs and Co-operative Development. The name of the co-operative was given as "Chamatamba Grazing Scheme". Clauses on

membership dealt only with the composition of the committee, and one clause stated that "all members elected to sit on the committee shall be members of the co-operative (Scheme) at the time of the election". This was profoundly ambiguous. The chairman stated that all those residing in the 5 kraals were members of the co-op, but other members of the co-op confirmed in interviews that membership was in fact restricted to the 15 founding individuals.

Thus the lines of demarcation between projects to improve general social infrastructure and develop the grazing scheme and woodlots, (for the benefit of all co-owners of the commons), the pen fattening project, (in principle open to any scheme member but in practice largely restricted to the larger herd owners), and the cooperative, (a private business initiative), had been blurred, and perhaps deliberately so. Why had this occurred, and whose interests were served?

Power and decision making

The cattle wealthy dominated decision making in Chamatamba. The leadership of the scheme (ie. the committee), those farmers engaged in pen fattening, and the membership of the co-op were almost all drawn from this group or their immediate families.

The average cattle holding of Committee members in 1988 was 14.3 head, more than twice the community mean (6.2 head), and more than the mean for cattle owners only (10.5 head). Only 3 of the 11 Committee members owned less than 10 head, and one of these owned 9. The Secretary of the Scheme owned only 3; he was a relatively well educated younger man with a good job in Harare who visited his home in Chamatamba most weekends and owned a small shop there. The sabhuku for Makuvire kraal owned only 2 cattle as a result of recent roora commitments. Three of the Committee, including the Chairman, owned more than 20 cattle each.

Not all the farmers who had engaged in pen fattening could be identified, but of those who could all were large herd owners. At least one came from Chirata kraal.

The average cattle holding of co-op members in 1988 was 13.0. Four of the 15 members were sons of leading members, including the Chairman and Vice-Chairman, and the sons' cattle holdings were much smaller, amounting to a total of only 10 animals between the four younger men. The mean cattle holding of the other, more senior, co-op members was 18.3. The sons were all men with jobs in town, and one can speculate that their membership helped ensure an inflow of capital to the enterprise.

Another relevant characteristic of this leadership group was the presence of most of the masabhuku or acting masabhuku within it. As stated above, the masabhuku of all five kraals in Chamatamba were represented on the grazing scheme committee, and four of these were large herd owners. The co-op group contained four

masabhuku: three from within Chamatamba (from Mhiriphiri, Munemo and Msonza) and one from Chirata kraal.

Between 1988 and 1990 the active core of the grazing scheme committee, a group of about 5 or 6 men, met regularly and informally at the primary school to discuss their various projects, but very few general meetings of the whole community were called. Those that were held were poorly attended. Decisions were communicated to residents by word of mouth through the masabhuku or his "assistant". Some tasks (e.g. collecting maize contributions from households for sale as a way of generating community funds) were delegated to the masabhuku. There was no hard and fast distinction made between committee meetings and co-op business meetings. Although no minutes of meetings were kept, the co-op kept financial records of its fertilizer, seed and cement trading activities.

In summary, then, both political and economic power in Chamatamba was concentrated in the hands of a small but active group of wealthier men. This group drew its power partly from the strong allegiance of most households to "traditional" forms of authority, partly from the status of its educated and eloquent chairman and the close association between the leadership and the local school, and partly from the proven success of this leadership in bringing development funding into the community. The "grazing scheme" in Chamatamba denoted much more than a project to manage grass and livestock; it was at the centre of a carefully nurtured image, or representation, of a self-reliant and dynamic "resource-managing community". This image appears to have been used as a vehicle for the establishment of purely private economic ventures undertaken by the Chamatamba elite.

3.2.4 Key actors

The preceding sections allow us to identify the following groups (collective identities) and agencies as key actors in Chamatamba grazing scheme. Firstly, within the local social structure, membership of the five kraals in Chamatamba was important. A few members of Chirata kraal, nominally outsiders, were part of the power elite. It was relevant whether or not a household belonged to the group of large herd owners, small herd owners, or non-owners. Membership of the agricultural co-op was another critical dimension.

In terms of the local power structure, key actors were the masabhuku of Mhiriphiri, Munemo, Msonza, Makuvire and Chinyanga kraals, and members of the grazing scheme committee. Important external agents and agencies were extension staff of Agritex and the Forestry Commission, the Natural Resources Board, the Cold Storage Commission, and the Beit Trust[6]. Local government

[6] An advisory committee of the Beit Trust was brought to visit Chamatamba in April 1988 by Professor Marshall Murphree of the Centre for Applied Social Sciences at the University of Zimbabwe, and by the author of this report. The latter provided

officials who influenced the course of events in Chamatamba included the Councillor for Ward K, executive staff of the District Council, and the District Administrator.

3.2.5 Patterns of interaction and struggle

There are three distinct phases in Chamatamba's recent history. In the first, from roughly 1983 to mid-1987, the emphasis was on projects which were uncontroversially "community-oriented" in character and the scheme leadership acquired both local legitimacy and a wider reputation for effective organisation. Work sessions were organised for the building of the bridge-dam on the Nyakandowe River, the erection of the first "grazing scheme" fences, and the planting of gumtrees along the fence lines. According to informants these were well attended.

In the second, from September 1987 to mid-1989, the scheme leadership focussed its energies on pen fattening of cattle and the establishment of the agricultural supply co-operative. The grazing scheme committee devoted some of its energies to attempts to obtain donor funding for a windmill, a borehole and fenced paddocks. The fruit orchards project was also initiated in this period, but only the orchard at the homestead of the Chairman, Mr Mhiripiri, was actually established. Few general meetings were held, and only one community work session for the repair of fences was called, in June 1989. This was poorly attended (by 27 people, representing 21 percent of all households in Chamatamba), and the fences were in a complete state of disrepair within a month.

In the third phase, from mid-1989 to December 1990, the major focus of the scheme became the windmill/borehole and paddocks project in the central grazing area. Donor funds were received, the District Administrator provided fencing materials, and the committee had to work hard to purchase additional fencing materials, organise work sessions, hire a drilling rig, obtain a measurement of borehole yield, and purchase a windmill. Another project to which the committee devoted its attention was an application by Chamatamba to join the Cold Storage Commission's Cattle Finance Scheme (CFS), which is aimed at encouraging beef production in the Communal Lands. This third phase saw the emergence of open antagonisms within the community, mostly centred around the windmill/borehole and paddocks project.

One incident revealed the lack of community consensus on the new paddocks. On 21st July 1989 informants from Chinyanga village expressed their disillusionment with the way that "community

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assistance to the grazing scheme committee in the drawing up of a budget to submit to the Trust in support of its application for funds for the windmill/borehole project. The research project has thus itself impacted upon the internal dynamics of decision making in Chamatamba, in part by providing additional incentives to the scheme leadership to present itself to the "outside world" in a highly positive light.

wire" had been used. The boundary wire won in the conservation competitions did not extend as far as their village and they felt that the neglect might well continue. "The borehole is in Mr Mhiripiri's village and the paddock is in his village as well; pen fattening is in Munemo's village".

On the 1st August work on the fencing of the new paddocks began. Twelve men reported for work and all villages were represented except Makuvire and Chinyanga. During the day a note arrived from the Chinyanga youth: "We have our own football team but no ball. We are prepared to do any fencing work in return for a ball." Wisdom Muza, research assistant, reported that:

> All the people who were there had to think about it over and over again, and they decided not to reply to the letter..... But many people were complaining about those who were not coming to work. People in Chinyanga were saying that when the loan comes it will only be available to the people in the pen fattening project. They said that if the committee proclaimed that the money was to be used for the benefit of the whole community they would be prepared to join in. But it is still a stone unturned to me, since people who are attending the erecting of the fence are not members of the pen fattening project. Truly speaking the money should be for everybody and not be confined to a few individuals.

Work sessions to erect fencing in the first two paddocks continued through the months of August and September, and the third paddock was completed in November 1989. The pattern of attendance established at the beginning remained more or less constant throughout: numbers were small, there were always committee members present to organise and supervise the work, and large herd owners who were keen to participate in the Cattle Finance Scheme (and this included the small number of cattle wealthy households from Chirata kraal) made up the majority of participants. Often the small herd owners or non-cattle owners present were male relatives (brothers or sons) of committee members.

Other antagonisms emerged in the course of the next 9 months. The leadership group suffered internal strains as it took the burden of seeing the borehole/windmill/paddocks project through to completion almost entirely onto its own shoulders. Members of the committee could not agree on ways of raising the level of attendance at work sessions, the Chairman refused to use his personal vehicle for transport of fencing materials, and members of Munemo and Mhiripiri kraals began to express resentment at the poor commitment of members from other kraals. No attempt was made to invoke by-laws of any kind. Chinyanga kraal members continued to boycott work sessions and to question the "community" character of the projects.

Although no open challenges to its authority were made during 1990, the committee was unable to arouse much enthusiasm for its

activities amongst ordinary members. The windmill/borehole/paddocks project was accepted as being essentially for the benefit of the better-off minority with sufficient resources to engage in pen fattening, but some benefits to other cattle owners were also anticipated. One non-cattle owner from Munemo kraal who often made use of his father's animals for ploughing and milking, felt that the paddocks were a good idea even though he personally could not afford the expenses involved in pen fattening. This, he said, did not usually take place all year round, and in between the paddocks might prove a useful way to relieve the labour of herding during the summer months.

The members of Chinyanga kraal remained alienated, but their attitudes were revealing. At a group discussion in February 1990 some of them expressed a great deal of resentment at their neglect by the Chamatamba leadership. The new paddocks were to be used for the pen fattening scheme, "not for the community", but it was still possible that one or two people from Chinyanga, who could afford the high costs involved, would be able to participate. Anxiety was expressed over the possibility that the central area would in time be used only for intensive grazing, whereas people also needed it to supply thatching grass.

It was significant that members of the disaffected kraal of Chinyanga continued to assume that their kraal was an integral part of the larger collectivity of "Chamatamba", and that the leadership's main faults lay in not extending to all members the benefits of development projects. The notion that the central grazing area was a communal resource was strongly affirmed, as was the "rule" that this should be used as a winter grazing reserve. Use of the new paddocks for pen fattening was accepted because participation was in principle open to anyone from Chamatamba who could afford the costs involved. Central to this discourse were notions of "communal resource use", "community" and "development" which did not differ significantly from those put forward by the Chamatamba leadership.

The leadership group's response to growing disenchantment was to reiterate the importance of both "community" and "development", and to interpret the criticism from within the dominant discourse. Ideas which had been present throughout (e.g. characterising the views of critics as coming from a "negative minority") received greater emphasis. Greater stress was placed on the role of "leadership" and "education through example", as a way of explaining how development of the community could be initiated through projects in which only a wealthy minority participated. Most households in Chamatamba were said to be part of the "passive majority" who needed to be shown the way forward. "You cannot win people over in one step. You must show them that these projects can succeed", said the Chairman (F.Mhiripiri 20/1/90).

As the borehole/windmill/paddocks project took shape the leadership continued to emphasise its character as a "community" project:

> The fences, water troughs, and windmill don't belong to one person, but to Chamatamba. The road and the bridge are used by everyone, and it will be the same with the new paddocks" (F. Mhiripiri 19/2/90).

By the end of 1990 it appeared to be the case that this discourse of "community development through leadership enterprise" was able to subsume and neutralise, to a large extent, the antagonisms which had begun to be expressed. Nevertheless, the antagonisms remained and it was clear that they would have to be taken into account by the leadership in any future developments.

3.2.6 Outcomes

By the end of 1990 it was clear that on Chamatamba's rangeland only a "minimum" form of common property had come into being. Membership of the scheme was relatively clearly defined (although there remained a degree of ambiguity as to the boundary with Chirata kraal), and more effort was devoted to excluding neighbours' cattle than enforcing the deferred grazing rule. Within this tenure regime a small group of cattle wealthy households with political power pursued a strategy of private accumulation, under the guise of "community development".

The scheme leadership managed to secure substantial external support for development projects which benefitted mainly themselves, but were also constrained in the extent to which they could pursue this strategy. The dominant discourses of "community" and "development", which the leadership manipulated so ingeniously, were sufficiently ambiguous to allow this manipulation, but nevertheless provoked expectations amongst the membership as a whole of a flow of at least some material benefits for themselves.

The project of fattening cattle through the Cattle Finance Scheme, using the new paddocks and the borehole/windmill water supply in the central grazing area, reflected this tension most clearly. Cattle were to be taken from the CSC on credit, and, although obtained only through group negotiations, would be individually owned. Any profits earned would accrue to individual owners. However, the project was based on communal grazing land developed with funds granted for a community project. The principle that it was open to anyone from within Chamatamba who could afford the associated costs served, therefore, to balance the fact that private profit was being pursued through the use of collective resources.

In Chamatamba the antagonism between private and collective use of grazing land could be contained partly because of the relatively plentiful supply of grazing resources. The paddocks did not enclose the whole of this area, and fears that the supply of thatching grass would be threatened by intensively grazed paddocks were not yet justified. In other words, communal use was not yet under threat. The sinking of a borehole and erection of a windmill were in any case significant improvements to Chamatamba's resource base, whatever their immediate use. The pen

fattening project was thus being tolerated by the majority of Chamatamba's members partly because it was perceived to bring potential benefits to a much wider group than the leadership elite alone.

Thus the outcome of the power plays within this grazing scheme was neither a high degree of equity, nor unrestrained domination by the elite. Rather, a situation of minority decision making and unequal benefits, in relation to projects which for the most part had to remain open, in principle, to the majority, reflected an uneasy compromise between different groupings within the contested terrain of "development" within Chamatamba.

3.2.7 Rangeland management and differentiation in Chamatamba

The question of how to improve management of rangeland resources in Chamatamba was discussed with an ecologist who has visited the scheme, Peter Frost, and at a well attended community meeting in November 1990. The first issue requiring clarification in these discussions was that of the objectives of livestock holders; in Chamatamba two distinct sets of objectives appeared to be held. One set was held by all cattle owners, and corresponded to that described for Communal Land draught-oriented herds in general (Danckwerts nd; GFA 1987; Scoones and Wilson 1989); the other was held only by those large herd owners who were interested in beef production through pen fattening. Improvements in rangeland management were judged to be feasible in terms of both sets of objectives, but rather different technical and institutional innovations would be required.

Frost's main recommendation for a draught-oriented herd was to aim at improving cattle condition at the end of the dry season. This was because this is the time of year when the greatest physical demands are being made on the animals, and a time when they are in poorest physical condition. One way to achieve this in Chamatamba would be to improve the quality of the dry season grazing in the central area, which was dominated at the time of the study by unpalatable grasses such as Schizachyrium jeffreysii, Hyparrhenia spp, and Elyonurus argenteus. A late dry season burn on at least a portion of this grazing land could improve forage quality: regrowth would provide more plant protein in animals' diet just before the start of the ploughing season, and would thus improve the usefulness of these rather poor grass species.

Institutional action would be needed to carefully manage such a strategy. The areas to be burnt would need to be carefully identified, since they would have to contain sufficient residual soil moisture to permit sustained regrowth under the combined effects of fire and grazing. This points to either low-lying areas close to the rivers, or more clayey soils, or other areas where the water table is high. Cattle would have to be kept off the burnt area until the grass had regrown to at least 8-10 cm. The burn and its control would have to be organised, and community support for such an intervention secured (burning is

still frowned upon by extension staff and thus also by many farmers).

Frost suggested that fertilisation of Cynodon dactylon on the termitaria would probably not improve efficiency since water rather than fertility is the limiting factor on these soils. He also suggested that the most appropriate action to take in relation to the riverine areas was to monitor them for signs of degradation (e.g. incisions, gullies), to undertake protection and reclamation measures when required, and to control cattle access to degraded areas.

More conventional recommendations for improving management would be to develop a system of paddocks in order to practise Short Duration Grazing (SDG), as advocated by Agritex extension staff. The effectiveness of rotational resting in Chamatamba was questionable, however, given that most grass species were so fibrous and unpalatable.

If beef production was the main objective of livestock owners then the conventional methods of improving pasture quality during the wet season (planting improved species, including legumes, fertilising, and possibly irrigation) were recommended by both Frost and extension staff. The cost of such interventions would be high and their financial viability doubtful.

The Chamatamba leadership had clearly opted for the objective of beef production in relation to the use of the new paddocks. As became clear at the community meeting in November 1990 they had managed to secure at least acceptance (if not approval) of this project by the majority of residents. They were thus much more interested in pasture improvement using exotic species than in management practices aimed at improving the supply of draught power within the community as a whole - probably because for large herd owners draught supply was not a major problem.

If draught-oriented livestock production objectives were to become the central focus of grazing management within Chamatamba, then the questions of optimum size, and of an institutional structure able to ensure that management rules were observed, would have to be addressed. The subdivision of the scheme into at least two management units might be desirable, since the distance between Mhiripiri village at the northern end of the scheme and Chinyanga village at the southern end is approximately 7 kms. Subdivision might also assist in the development of a more effective decision making capacity. If, for example, Mhiripiri and Munemo kraals managed one unit in the northern part of the scheme and the other three kraals managed the other, then the problem of uneven locational advantages could be reduced. This would address one of the sources of tension within Chamatamba.

3.3 MUTAKWA GRAZING SCHEME

Two case study schemes, Mutakwa and Maraire, are situated in Zimuto Communal Land, which has a long history of state interventions into rangeland management and local systems of land use. Of the 5 case studies presented here Mutakwa was the most typical of the fully-funded and fenced schemes which have been the major focus of grazing management extension programmes since independence. In these Agritex officials play a major role in planning the scheme's layout and management system, negotiating costs with donor agencies, supervising the erection of fencing, drawing up by-laws, and advising communities on the operation of the scheme.

In Mutakwa, however, the design of fenced paddocks took little account of existing patterns of resource use, and contributed towards tensions and disputes both within the community and with neighbours. Conflicts over vlei (dambo) grazing land in particular, much of it situated outside of fenced paddocks, made rangeland management the site of a fierce contestation for power at the local level.

3.3.1 The context: Zimuto Communal Land

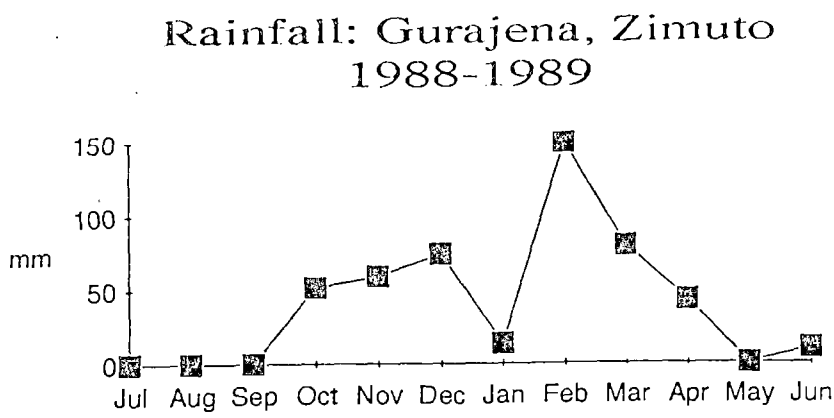
Zimuto Communal Land is situated some 35 kms north of Masvingo (formerly Fort Victoria), the capital of Masvingo Province. Average rainfall in Zimuto between 1981/82 and 1989/90 was 511.1 mm. Rainfall for each year in the past decade and for each month in the 1988/89 and 1989/90 seasons is shown in Figure 6. Vegetation is of the Burkea/Terminalia type with Brachystegia spiciformis (msasa) woodland on the main crests and Julbernadia globiflora on areas with slightly heavier soils (Jordan 1964: 66).

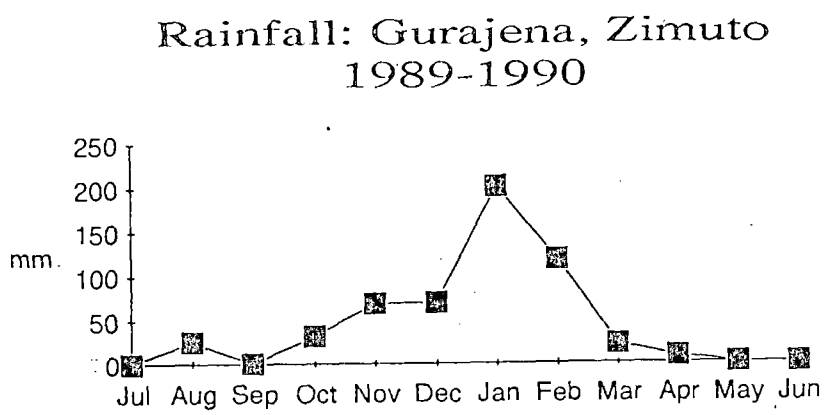
Zimuto falls on the boundary between Natural Regions III and IV, and is classified as being suitable for "semi-intensive livestock farming" based on livestock and drought-resistant crops. As with most other Communal Lands, however, farmers depend on a mixed crop-livestock farming system. In Zimuto this is made possible by the large number of vleis which criss-cross the Communal Land and drain into the two main rivers, the Munyambi and the Popotekwe.

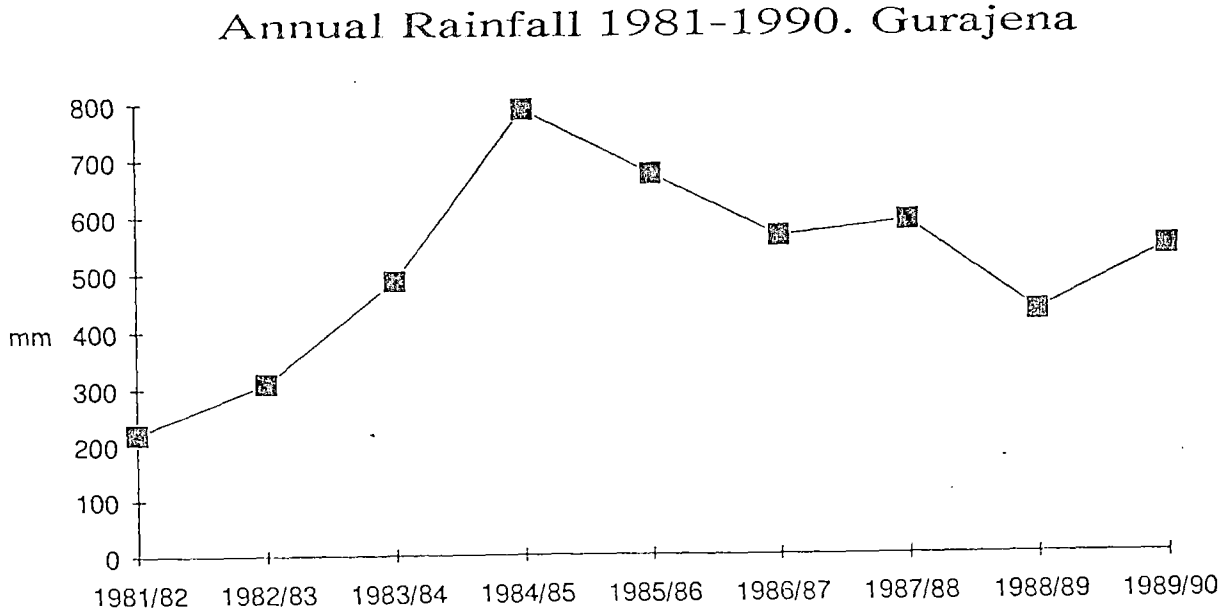
E.D.Alvord, the first Chief Agriculturalist in the Native Department, surveyed Zimuto in 1933 in preparation for its "centralisation". Alvord assesssed 91 percent of the Reserve as suitable for arable farming, most of this consisting of a grey sandy loam. About 2,200 acres (3 percent) was estimated to be dark-grey to black sandy loams, found in the vlei lands, and characterised by Alvord as of "high to very high productivity", particularly suitable for arable lands if properly drained.

Alvord assessed the quality of both the grazing and the condition of cattle as "generally good" at the time of the survey in September 1933 (ie. in the late dry season).

Figure 6. Rainfall at Gurajena, Zimuto







According to Alvord

> The good grazing, however, was largely due to the numerous vleis with young grass and the clumps of green grass and reeds along the small streams and rivers. Judging from the appearance of the cattle one would hesitate to say that the Reserve was heavily stocked... (Alvord 1933).

Centralisation was implemented over the next few years, despite some opposition. Arable and grazing areas were clearly demarcated and the previously scattered pattern of settlement was replaced by movement into the "lines". The vleis continued to be used for both cultivation and grazing, however. Compulsory destocking was introduced in 1946, initially targeted at 1500 head of cattle and 1200 goats. By 1948 the number of cattle had been reduced from 8514 to 6408.

Of all the former Native Reserves Zimuto has experienced one of the longest and most sustained efforts on the part of government planners to introduce "improved grazing methods". This history stretches from the first centralisation in the 1930's to the contemporary period.

In 1946 the Animal Husbandry Officer for Fort Victoria North District reported that in his opinion "deterioration of the grazing ... is critical... I feel that the only remedy will be controlled grazing by paddocking...", and recommended the planting of Napier Fodder on unoccupied arable land[7]. Paddocking commenced in some areas in 1947, as was the planting of Napier grass in pasture furrows. A limited recentralisation of the Reserve was initiated in 1948, in order to increase the proportion of grazing land, and a system of deferred grazing was introduced in 1949 which, according to Jordan (1964: 62) was still "fully operative" in 1964.

Robinson (1951) has described the first grazing schemes in some detail. These were located mostly in the vlei lands. The justification for introducing the schemes, without much attempt at consultation with local residents, was that the grazing areas had a "sparse grass cover" and the vegetation indicated "a worn out and overgrazed veld and soil of low fertility". The vleis were drying out and "erosion was much in evidence" (Robinson 1951: 3). The Native Agriculture Department decided to begin a major programme of "pasture improvement".

To begin with an area of 1460 hectares was fenced into four paddocks. A system of rotational grazing was adopted, paddocks being grouped in pairs and rested from January to March in alternate years. Pasture furrows were constructed in the vleis in order to "check erosion", and sponge areas were fenced off from livestock. Because more fencing could not be obtained other grazing areas were divided into "paddocks" by means of

[7] National Archives file S160/DP/101/150.

demarcation banks and the animals were herded within these. Hay making and silage production were carried out with the help of mechanical mowers. By 1952 the Provincial Agriculturalist reported that a total of 44,467 acres was under rotational grazing in Zimuto Reserve, and the second centralisation exercise was said to have been completed in that year[8].

Demonstrators and Rangers ("a kind of agricultural police" according to Aquina 1964: 19) were used for "supervision", and the people were "warned" when resting periods were due to start. In December 1949 the Land Development Officer (LDO) for the District reported that "the grazing rotation applicable to a few camps will now be enforced throughout the Reserve". Reports by agricultural staff of the period are filled with anecdotes of authoritarian decisions with regard to agriculture and land use in general, and occasional acts of overt resistance on the part of local inhabitants, attempts to evade controls, and the passive resistance evidenced in such comments as "...the general apathy of the Reserve people together with an unprogressive and uncooperative Chief is making an ordinary uphill task even more difficult"[9].

In 1955 Zimuto was surveyed prior to the implementation of the Native Land Husbandry Act of 1951, following which individual arable and grazing rights were allocated (Jordan 1964: 62). The boundaries of village grazing areas were mapped and gum trees were planted as permanent boundary markers. Grazing rotations through the 1950s and early 1960s continued to be of the two paddock/ deferred grazing type.

In the early 1970s multi-paddocked Short Duration Grazing (SDG) schemes were widely promoted in Victoria Province (Cousins 1987: 15-16). A number of schemes of the type described by Froude (1974) and Danckwerts (nd) were located in Zimuto. These collapsed after the mid-1970s as the war took its toll; local residents remember pitched battles between guerillas and the Rhodesian armed forces, the killing of kraalheads (masabhuku) named as "sellouts", and the disappearance of fencing materials from grazing areas.

The boundaries between grazing lands continued to be recognised, however, marked by beacons or gum trees, on old Land Husbandry maps held by extension staff, and in people's memories. After independence in 1980 extension staff revived the notion of SDG schemes, promoted them widely within the District, and disinterred some of the plans which had been drawn up in the course of the previous decade. Donor agencies such as the EEC began to make funding available for the purchase of fencing materials.

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[8] National Archives file S160/ACC.

[9] National Archives file S160/DP/101/150

3.3.2. Ecological and technical characteristics

Land use and habitat patches

Land use and habitat patches in Mutakwa grazing scheme at the time of the research in 1988/89 are shown in Figure 7 and Table 3.12. The villages of Nhanzva and Tirivanhu stretched from east to west, between two of Zimuto's major roads. The six fenced paddocks were found in the east, on either side of the Gurajena road, and each paddock abutted the perennial Munyambi River. The paddocks enclosed 235 ha, which was 36 percent of the total land area within the scheme. Vleis and drainage lines comprised only an estimated 68.75ha, or 10.5 percent of the total. The stocking rate for the paddocks alone was 1 LU: 0.85 ha, and for the area as a whole 1 LU: 2.3 ha - much higher than the recommended rates of 1 LU: 6-8 ha.

Table 3.12 Habitat patches available for grazing within Mutakwa grazing scheme in different seasons

	Wet season (ha)	%	Dry season (ha)	%
Reverted arable	123.4	29.1	123.4	19.3
Fields	0	0	178.5	27.9
Contours	0	0	12.0	1.8
Tolands	198.4	46.7	198.4	31.0
Vleis and drainage lines	68.8	16.2	68.8	10.7
Home sites	24.8	5.8	49.5	7.7
Riverine	9.4	2.2	9.4	1.5
Total	424.8		640.0	

Half of the total area of vlei land was found within the paddocks - some 35 ha. This comprised 14.8 percent of the total area which was fenced. The major vlei line draining down through the centre of Mutakwa was known as the Chokupa vlei. Most of the wooded toplands fell within the paddocks, and comprised 81.5 percent of the fenced area. The dominant tree species were Brachystegia spiciformis and Julbernadia globiflora, underlain by an extremely sparse cover of grasses and invaded by unpalatable Lophalaena and Helichrysum shrubs.

Arable fields were located on the crests rather than lowlying areas, but many were also found on the margins of the vleis which drain into the rivers and small streams. There was a growing land shortage in Mutakwa, and the substantial area of "reverted arable" (land being rested to recover its fertility) was under pressure from young families from within the community as well as outsiders seeking land to settle on.

Figure 7. Land use in Mutakwa grazing scheme

The grazing scheme

It seems likely that in Mutakwa some sort of deferred grazing system was in force during the 1940s, but older residents remember the first paddocks as having been introduced in 1959. They were initiated by the Agricultural Demonstrator, who did not consult with villagers but "simply told people what to do". There were two paddocks to begin with, one for Nhanzva and one for Tirivanhu, the boundaries being demarcated by gumtrees. The two grazing areas were rested in alternate years, between January and March. The toplands were not used much by livestock since they did not contain a great deal of grazing. According to one informant, "cattle always used the vleis because they were fertile", and another stated that "tall grass was found in the vleis only".

The sabhuku for Nhanzva at the time of research, Chitime, said that people were not happy with the grazing area demarcations made at that time; these meant that they were cut off from the vlei grazing in the neighbouring Chidakwa village area. Although they were forced to follow the demarcations when herding their livestock, he and others defied the regulations and put their cattle onto the Chidakwa vleis; they were then forced to pay a fine at the police camp.

Fencing made its first appearance in 1968. Money was collected from each family and a boundary fence was erected along two sides of the grazing area, "to keep out the neighbours' cattle". Poles were used to show the internal divisions into paddocks. Between four and six paddocks (informants were not in agreement) were then marked off and fenced. Rotations were supposed to follow a cycle of 14 days per paddock. As with other grazing schemes, the paddocks were not operational during the liberation war years and fencing wire disappeared.

After independence the idea of reviving the grazing scheme was raised by Agritex extension officials, and initial discussions with the Mutakwa leadership were held in 1985. The donor, the EEC Micro-projects Programme, provided fencing materials worth $7002, and the community was asked to provide labour for fence erection and to supply timber for fencing poles from local woodlands. A small cash contribution of $0.45 per family was levied to buy tying wire and nails. Agritex planners retrieved the 1970s paddock design from their files and replicated it with a few modifications. The recommended rotation was two weeks per paddock during the growing season. Fencing began in May 1986, was completed in 1987, and the paddocks were first used in the 1987/88 season.

Patch use by livestock

Habitat patch use by foraging livestock was investigated between January and December 1989. Two herds of cattle located in the east and west of Mutakwa respectively were followed. Herding of these herds was sporadic throughout the year, since cattle were enclosed in paddocks during some of the growing season, and were

sometimes herded into definite locations even during the dry season.

The two herds displayed broadly similar foraging behviour across the seasons, but there were a number of differences as well. These arose mainly because of the different locations of the home kraals of the herds. The herd from the west of Mutakwa, located across the Chatsworth road, hardly used the paddocks at all, and only in the late dry season. The bulk of grazing was done in the small vleis which abut onto the railway line, in the narrow strip of toplands along the railway line, and in the reverted arable in the west. In the early dry season the harvested fields were heavily utilised.

The herd from the east of Mutakwa used the fenced paddocks to a much greater extent, but even in the cropping season for only 34.2 percent of total feeding time. In the early dry season and late dry season paddocks were used for 17 percent and 27 percent of total feeding time respectively. The community herd as a whole was never observed to be using the same paddock simultaneously, and there was no regular rotation practised. The dominant pattern throughout the year, but most markedly during the cropping season, was for livestock to be taken to the paddocks only during the afternoon, and left there until evening. During the mornings small co-operative herding groups herded animals in other habitat patches. One rationale for this was that the smaller individual herds could be taken into small drainage areas or pieces of reverted arable more easily, with less danger of damage to crops.

Using combined data for the two herds, the use of the habitat patches in three different seasons (cropping, early dry and late dry) was estimated by calculating the percentage of feeding time spent in each type of habitat (Table 3.13).

Table 3.13 Seasonal habitat patch use in Mutakwa, 1989 (expressed as a percentage of total feeding time)

	Cropping	Early dry	Late dry
Fields	-	27.2	5.0
Reverted arable	28.8	12.1	3.0
Contours	-	18.8	4.4
Home sites	10.2	10.0	17.5
Toplands	17.5	12.3	18.0
Vleis and drainage lines	39.1	19.6	39.3
Riverine	4.4	0.0	12.8

0.0 = patch available but not used

Table 3.13 reveals that vlei grazing was critically important during the cropping and late dry seasons. Fields and contours assumed great importance in the early dry season. The riverine habitat, and home sites (where cattle were fed with stored crop

residues), played a major role in sustaining livestock during the late dry season. Resource use was "patchy", heterogeneous in both space and time. Some grazing habitats were more important than others, and those that kept animals alive through the late dry season are perhaps the key to understanding how such high stocking rates could be sustained.

The large proportion of time spent in the reverted arable in the cropping season partly reflects the relative scarcity of vlei grazing for the herd from the west of Mutakwa, partly the shortage of grazing land for the community as a whole. The low figures for topland grazing reflects how little time was spent in the fenced paddocks, but also the low preference for this habitat in general. This pattern is highlighted by calculating the preference index for habitat types (Table 3.14).

Table 3.14 Foraging preference index, Mutakwa 1989

	Cropping	Early dry	Late dry
Reverted arable	0.99	0.63	0.16
Fields	-	0.97	0.18
Contours	-	0.89	2.3
Home sites	1.76	1.30	2.27
Toplands	0.37	0.40	0.58
Vleis and drainage lines	2.41	1.83	3.67
Riverine	2.0	0	8.53

Deferred grazing in Chokupa vlei

In the course of the cattle following exercise another resource management strategy practised in Mutakwa became visible, one which had not been referred to by Agritex staff or by community members in initial interviews. This was the closure of the upper portion of Chokupa vlei, which lay outside the paddocks and was perhaps 15 to 18 ha in extent, for a period of time in late summer. In 1989 this "key resource" was closed from mid-February to mid-April, and in 1990 from late January to late April. According to informants this practice of deferring grazing on a highly productive vlei area during the late summer months had been a feature of life in Mutakwa for many years. Its origins were probably the earliest deferred grazing systems introduced into Zimuto in the 1940s. The actual timing of the closure depended on rainfall.

It is interesting to note that this deferred grazing system operated with a fair degree of effectiveness even though no fencing was involved. No complaints of poaching of grazing in Chokupa were recorded during 1989 and 1990, although according to Chitime the planned closure in 1990 between January and the 1st July would only be effective if "people do not pressurise us by illegal use". Some people in Mutakwa felt that there was

insufficient vlei land for winter grazing. Nevertheless, the system had been maintained for many years.

One factor in the relative effectiveness of this exclusion rule may have been the highly visible location of the vlei, sandwiched between fields and homesteads (see Figure 7). However, the habitat patch use data demonstrates how important vlei grazing was in Mutakwa, and the rule was aimed at spreading the availability of scarce grazing resources across seasons. It was thus effective mainly because it made sense as a management strategy, and was understood and accepted within the group of co-users.

3.3.3 Socio-economic differentiation

The community of Mutakwa comprises two "kraals" or villages which have a common origin and a long history of shared resource use. The population in 1988 was approximately 662, including household members working in urban or other locations. Nhanvza kraal contained 62 households and Tirivanhu another 42, a total of 104 households.

Although the distribution of arable land was not highly skewed within the community, the same cannot be said for grain production or for crop sales. Using maize sales as an example, of the 520 bags sold in 1988 57 percent came from only 11 households, and 35 percent came from the top four sellers. Figures for total grain production show a similar pattern.

The distribution of cattle was highly skewed; 42 households owned none, and only 15 owned more than ten. The mean herd size for the remaining 42 households was 5.2, compared to a mean herd size of 11.9 for the large herd owners. This group of large herd owners owned 45 percent of all the cattle in Mutakwa. Only 6 head of cattle were sold in 1987/88 in Mutakwa, and four of the five households involved were large herd owners.

The most significant index of socio-economic differentiation in Mutakwa appears to be cattle ownership, which was strongly associated with successful crop production. Neither gender of household head nor the presence of wage workers in a household were as strongly correlated as cattle with a number of wealth indicators such as total grain production, ownership of implements, type of roofing used on houses, and amount of school fees paid. Maize sales for the three groups of cattle owners are shown in Table 3.15.

Table 3.15 Maize hectarage, maize sales and cattle ownership in Mutakwa 1987/1988

	Cattle ownership			
	0 cattle (n=40)	1-9 cattle (n=45)	10 or > cattle (n=14)	ETA
Hectares under maize (mean)	0.6	1.0	1.4	0.51
Maize sales in bags (mean)	1.7	5.6	14.2	0.50

3.3.4 Institutional arrangements and power relations

The masahuku and the grazing scheme committee

In the late 1980s the two major sources of authority over land in Mutakwa were the masabhuku (kraalheads), and the grazing scheme committee. The sabhuku for Nhanzva was Chitime Madzimba, who succeeded to the post when his father died in 1959, shortly before the paddocks were planned. Chitime said that as a result of his opposition to paddocks he was deposed as sabhuku and his younger brother Thomas was installed in his place. Thomas and sabhuku Tirivanhu were in favour of paddocks and co-operated with extension staff. Chitime claimed that people from Nhanzva refused to pay taxes because "Thomas was not the elder brother", and the District Commissioner then gave Chitime back the post of sabhuku. In 1963 the first grazing committee was formed, with Tirivanhu as chairman.

When paddocks were first demarcated using fencing, in 1968, the collection of money and the work sessions were organised by Tirivanhu. In 1972 or 1973 more money was collected and they were also donated wire after field days and competitions. In the early 1970s the committee continued to be chaired by sabhuku Tirivanhu, who decided on rotations. Some informants, however, claimed that the paddocks were used only in the afternoons, with livestock being herded by small co-operative groups of households in the mornings. Chitime asserted that Tirivanhu was shot by guerillas during the later years of the liberation war for harbouring a Selous Scout, and that "this is what happens to people who think they are clever".

When the grazing scheme was revived after independence a committee was elected under the chairmanship of Edward Mutsvuke, who had been secretary on the pre-war committee. Neither of the two masabhuku, Chitime and Titos Tirivanhu, son of the previous sabhuku, were on the committee. A new committee was elected in January 1988, allegedly because the previous chair and treasurer were not effective. Both the treasurer and the mupurisa

("policeman") for the scheme, had occupied these posts on both the pre-independence and post-independence committees.

Grazing scheme by-laws

A standard set of grazing scheme by-laws drawn up by Agritex was signed by the committee as a precondition for receiving assistance from the EEC, but the contents of these were not widely known within the community. The first three by-laws all referred to the setting of a maximum stocking rate within the scheme by Agritex staff, and its enforcement by the committee.

An alternative set of loosely formulated rules agreed at a community meeting was more widely, if still somewhat unevenly, known. These by-laws included rules on the use of the correct paddock in the planned rotation, the prohibition of fence cutting and the collection of leaf humus from the paddocks, controlled tree felling, and the paying of a fine of 50c for absenteeism from work sessions. In the case of those households who did not contribute any labour at all to the erection of fences a $20 fine was laid down.

At a group discussion with the committees of all four EEC-funded schemes in Zimuto, held in October 1987, the standard set of by-laws drawn up by Agritex was read out, and comments called for. None of the members of the committees had even mentioned their existence in interviews over the previous two days, and none of the schemes had made provision for control of stocking rates in their own by-laws. Yet all the committee members enthusiastically agreed that they did in fact remember these by-laws, had indeed signed them, and furthermore agreed with them.

However, in the period that followed there was no attempt by extension staff to fulfil their regulatory function as laid down in these by-laws: they did not communicate the recommended stocking rate to the grazing scheme committee in writing, there was been no control over rotations, and there was no attempt to recover the cost of the materials "in the event of the by-laws not being adhered to", (Clause 11, Grazing Scheme By-laws, reproduced in Cousins 1988: 162). It proved difficult, however, for the committee to enforce even the locally agreed by-laws.

The VIDCO and other institutional bodies

The Village Development Committee (VIDCO) included Mutakwa and its neighbour, Chidakwa, but was an extremely weak body and was almost completely inactive, The local Councillor, too, had no effective presence within the community.

Other organisations active in Mutakwa included "development-oriented" bodies such as the local farmer's club and a women's group, the leaderships of which were elected by their members. There was a fair degree of overlap in the composition of the various committees in Mutakwa e.g. the past chairman, the vice chairman, the treasurer and the secretary all sat on the committee of the farmer's club, and the secretary and two other

female members of the committee were leading members of an energetic women's knitting cooperative. Respondents generally gave as a reason for the election of these individuals their willingness to lead and be active on behalf of the community. This stratum of leadership might be said to have constituted a local "power elite".

The power elite of Mutakwa

To what extent did this politically powerful group coincide with the large herd owners who were also generally the most successful crop producers? The mean size of cattle holdings of the ten grazing scheme committee members in 1988/89 was 7.6, well above the mean for Mutakwa as a whole (4.0). There were two non-cattle owners on the committee, both women. The mean for cattle owners was 9.5; four members had herds of ten or larger, and two others had herds of 9 cattle. Thus the committee was by and large composed of the cattle wealthy in Mutakwa.

This group was also made up of people whose homes were in the "line" of settlement nearest the paddocks, and they were also all permanently resident i.e. they were not migrants, (although the vice secretary was the wife of sabhuku Titos Tirivanhu, an urban worker who visited his home at weekends). There were 5 members each from Nhanzva and Tirivanhu kraals.

External authorities

Agritex staff played a major role in reviving the Mutakwa grazing scheme, negotiating with the donor agency, and helping an institutional framework to emerge. From the mid-1980s to the end of the decade a number of grazing schemes were implemented in Zimuto, and the District Council discussed the adoption of the Model "Land Use and Conservation" By-laws (1985). Agritex planners from the provincial offices carried out a land use planning exercise in the District in 1989, and suggested allocating some of Mutakwa's grazing land to their neighbours in Mukengi kraal.

In all these instances external authority in one form or another had the potential to make decisions which would greatly affect decision making within Mutakwa; in none was this potential realised. Agritex staff effectively withdrew from their regulatory role; the District Council did not formally adopt the Model By-laws; and no re-allocation of grazing land was carried out. Despite this the attitudes and actions of people in Mutakwa continued to be influenced by fears that government would at some stage re-introduce a destocking programme. There was also a more positive expectation that the state, together with donor agencies, would continue to improve infrastructure (roads, schools, etc) within Zimuto and provide funding for agricultural projects in the name of "rural development".

3.3.5 Key actors

Having analysed the structural dimensions of the common property regime, we can now identify the key actors in the drama of Mutakwa grazing scheme. In terms of the social structure of the community itself, it was relevant whether or not cattle owners' homesteads were located nearby the fenced paddocks or were located further away, across the Chatsworth road. Membership of Nhanzva kraal and of Tirivanhu kraal was important. It also made a difference whether or not a household was a large herd owner, a small herd owner or a non-owner.

In terms of local power structures, the key actors were the masabhuku of Nhanzva and Tirivanhu kraals, and members of the grazing scheme committee. External agencies with the power to influence local dynamics included Agritex extension staff for the area as well as from the department's provincial headquarters, the EEC donor agency and state authority as represented (rather amorphously) by local government officials, elected District Councillors, and officials from other government departments.

3.3.6 Patterns of interaction and struggle

In the late 1980s the practice of reserving grazing in Chokupa vlei became the site of a prolonged struggle over key resource management in Mutakwa. In February 1989 the decision to close the vlei was made at a meeting of the grazing scheme committee. On the 25th of April the vlei was declared open by Chitime, the sabhuku of Nhanzva, without consultation with the committee. The following year Chitime asserted his authority again and declared the vlei closed on the 27th Janury 1990. He "took charge", he said, because the control of vlei grazing had been his responsibility in years gone by, and his authority in these matters overrode that of the committee.

At the same time Chitime vigorously denied that he had any responsibility for the organisation of fence repair sessions in the paddocks. "I can only take reponsibility when it is a burning issue. Until then it is the chairman's job", he said. The assertion of sabhuku authority in 1990 was not contested by the grazing scheme committee, a fact which can only be understood in the context of the complex power plays which arose over the maintenance of paddock fencing in 1988 and 1989.

By November 1988 the fences in Mutakwa's paddocks were clearly in need of repair, and in early December the Committee decided to call for weekly work sessions. These began in mid-December, with 30 people present. Under the overall direction of the scheme chairman, the men worked on the fencing and the women weeded the invasive Lophalaena and Helichrysum shrubs, found on the topland areas under the msasa trees. After the work session a meeting was held to discuss organisational issues. It was agreed that allowable excuses for not attending work sessions were illness, attendance at funerals, and cattle herding duties. The question of how large the fine for non-attendance should be was postponed to another meeting, and there was an animated discussion of the

urgent need to obtain payment of the $20 fine from those households who had not participated in the original erection of the fencing. The chairman also explained that the committee had given the masabhuku "the powers to push people to work in the paddocks".

Over the next few months the question of uneven attendance at work sessions threatened to undermine further maintenance of the scheme, and blame for this state of affairs was assigned by different people to several different actors and causes. People from Tirivanhu kraal began to blame Nhanzva people for not attending in sufficient numbers. Nhanzva people began to blame those members of their kraal who lived at the western end of the scheme, along the Chatsworth road. Some Tirivanhu people blamed the sabhuku for Nhanzva, Chitime, for not using his authority to ensure attendance. Another explanation offered was that the non-payment of the $20 fine by some 20 households was causing bitterness.

Members of Nhanzva who lived along the Chatsworth road responded in different ways, and sometimes contradicted themselves. Some denied angrily that they were not attending work sesions, or blamed the committee for not informing them of when these were due to start. Others felt that since they did not use the paddocks very much anyway they should not be obliged to maintain them. Two large herd owners said that the benefits of the paddocks were only reaped by those who lived nearby them, and one asserted that "the Tirivanhu people take all the advantages of the paddocks".

By February 1989 these tensions had brought the work sessions to a halt. Several meetings were held to try and resolve the problem, but attendance at these was generally poor. Eventually the decision was made to divide the organisation of work by kraal, with separate attendance registers being kept. Attendance at the next four work sessions was somewhat higher than average (36 percent, from both kraals, on average), but by April had fallen to very low numbers (12 percent). The work sessions lasted on average for only 3 to 4 hours, and levels of attendance were low. By June 1989 the repair work was still not complete.

The weeding of Lophalaena and Helichrysum by the women was carried out without a great deal of enthusiasm or energy, and it became clear that it was largely symbolic in nature. The weeding was recognised to be ineffective in preventing the invasion of the toplands by the unpalatable shrubs; it was carried out only because it was part of the standard set of Agritex recommendations for grazing management in Zimuto; people had little faith that it would result in a flourishing grass sward in the toplands.

Taken together, these facts indicated that upkeep of the fenced paddocks had a low priority for most members of Mutakwa, despite their widely recognised usefulness for relieving herding labour for parts of the day during the cropping season. Paddocks were not viewed within Mutakwa primarliy as a means to manage grazing;

they were first and foremost seen as an aid to livestock management and the organisation of household labour.

This conclusion is further reinforced when we examine the desultory attempts by the committee to institute a system of rotational grazing within the paddocks. The first attempt to do so occurred in late February 1989; before that date, said committee members, the late start to the rains had meant such poor grass growth that it was not worth beginning any rotations. According to the chairman Paddocks 3, 4, and 5 were closed on the 27th February, but large numbers of cattle and goats were observed in Paddock 5 on the 2nd March. On the 3rd March a large herd owner from near the Chatsworth road said that he had not heard of the closure, and a woman herding cattle in lower Chokupa vlei said that only Paddock 4 was closed.

In 1989/90 no attempts were made to begin rotations in the paddocks, and the dominant pattern of use, observed and also referred to in many interviews with residents, was for herding to take place in the mornings followed by use of the paddocks in the afternoon. Repair sessions began again in December 1989, after several months of inactivity, and continued through the rainy season, but attendance was generally low. The fencing in many paddocks was in a decidedly poor state by March 1990, with many posts beginning to rot and collapse.

3.3.7 Outcomes

The attempt by the grazing scheme committee to increase commitment to the scheme by invoking the authority of the masabhuku, and the resigned acceptance, in 1990, of Chitime's claim to regulate community access to Chokupa vlei, can be read as a failure to achieve legimitacy on the part of an embryonic common property decision making body. At the root of the failure, however, was a local perception of ecological reality and appropriate management strategies. The fenced paddocks were not perceived by cattle owners in Mutakwa as being useful in terms of managing access to scarce vlei grazing resources; rather, they were a way to reduce herding labour during the summer months, and as a result were most beneficial to those whose homes were located nearby the paddocks.

This locational unevenness in the spread of benefits resulted in a complex series of displacements of "blame" within Mutakwa, with accusations being traded back and forth. While there was some recognition that the location of the paddocks was problematic for those households living at the western end of the scheme, tensions emerged between members of the two kraals, Nhanvza and Tirivanhu. This was partly because there were more Nhanzva people living across the Chatsworth road.

The deferred grazing system on Chokupa vlei, however, was widely accepted as a useful management regime, and Chitime appeared to be capitalising on this to reinforce his authority as a sabhuku. Thus the problems associated with managing a conventional, paddocked grazing scheme were the occasion of a power play by one

sabhuku in order to regain authority over the use of vlei grazing land outside the paddocks, at the expense of the committee, and possibly to gain greater local legitimacy at the expense of the other sabhuku within the community.

This power play coincided with the emergence of tensions between the two kraals within Mutakwa, and together these tended to reinforce identification with the collectivities of Nhanzva and Tirivanhu rather than that of Mutakwa. While this was the case for many households within Mutakwa, it appeared to be less true for one important group in particular. This was the grazing scheme committee, which attempted consistently to rally support for upkeep of the paddocks on the basis of an appeal to "community" (i.e. Mutakwa) interests. It is clear that they failed in this project, despite an attempt to co-opt the authority of the masabhuku.

In the light of their identity as a cattle wealthy "power elite", how can we understanding the committee's role in local political dynamics? The most relevant characteristics of members of the Committee thus appeared to be a combination of their larger than average cattle holdings and, given the location of their homes, their interest in use of the paddocks for reduction of herding time. The fact that they were locally resident meant they were able to undertake such tasks as the organisation of work sessions.

If committee members' individual interests were well served simply by the maintenance of paddocks as an aid to herding, what explains their attempts (admittedly somewhat half-hearted in character) to institute a rotational grazing system? This can only be understood by referring back to the regulatory role of extension staff. Agritex staff oversaw the signing of by-laws as a condition of funding by the EEC, and were seen to represent the state and donor agencies. These by-laws contained the threat of removal of fencing materials if Agritex recommendations were not complied with.

The efforts made by the committee to institute a rotational system in Mutakwa can be seen as an attempt to maintain at least the appearance of conformity with the conditions of funding. This was aimed partly at preventing the removal of fencing (although this did not take place anywhere in Zimuto), and partly to ensure that the community was still seen in a positive light by state officials who offer general development assistance and who might bring in donors for other kinds of projects.

In the light of the analysis of habitat patch use by cattle in Mutakwa it would appear that the layout of the fenced paddocks frustrated rather than facilitated the management of the most important rangeland resource in Mutakwa, the vleis. In the eyes of livestock owners the practice of deferred grazing on Chokupa vlei was much more relevant than Short Duration Grazing in paddocks enclosing largely useless toplands. One positive feature of the paddocks for farmers was that they provided some relief from herding duties, and this was perhaps one reason why some

members of the community were prepared to put some of their energies into maintaining the fences.

The lack of fit between the preferred pattern of use and the way that the paddocks were supposed to be used undermined the emergent institutional order within the grazing scheme. The use of paddocks for rotational grazing was not perceived as useful and the attempts of the committee to institute rotations failed; this in turn contributed to the loss of legitimacy and effectiveness on the part of the committee.

Could efficiency have been improved by a greater focus on the "key resource" of vlei grazing? Or was the deferred grazing system being practised already optimal? Scoones (1987) has suggested that key resources be fenced off and reserved for particular types of animals (perhaps milking cows or draught animals) at certain times of year. The possibilities for new kinds of operational rules such as these, based on a different understanding of ecological dynamics, have not yet been explored together with livestock owners anywhere in Zimbabwe. To date the paddocks/SDG model has dominated extension thinking.

3.4 MARAIRE GRAZING SCHEME

Maraire grazing scheme is located 1.5 kms south of Mutakwa, and at the time of research the ecological characteristics of the two schemes were broadly similar. There were also important differences between the two schemes, however, and the most obvious of these was technical in character: none of the grazing land in Maraire was enclosed by fencing. A deferred grazing system was practised on the key resource of vlei grazing, but the scheme experienced many problems in its attempts to exclude non-members. A limited institutional capacity for rangeland management had been adequate in the past but was no longer so, and the scheme had come under great pressure from neighbouring livestock owners in recent years.

3.4.1 Ecological and technical characteristics

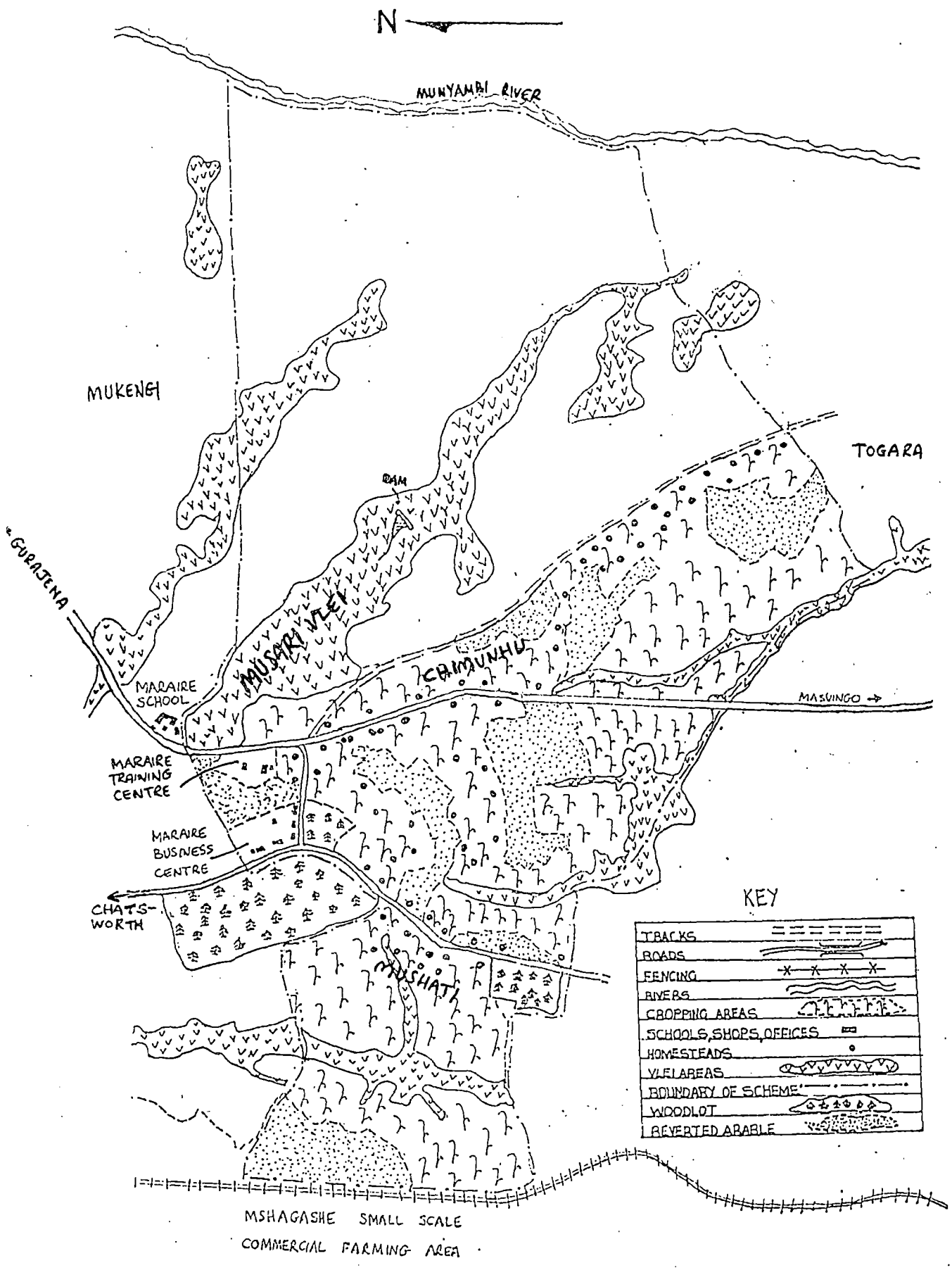
Land use and habitat patches

Land use and habitat patches in Maraire are shown in Figure 8 and Table 3.16. There were two kraals (villages) within the scheme, Chimunhu and Mushati, which had long been treated as one unit by resource planners, and the kraals were perceived by residents to be sub-units of the larger community of Maraire. Chimunhu was the "senior" kraal of the two, Mushati having been established as the result of the "fission" of Chimunhu in the 1930s. The two villages were not located in clearly separate zones of settlement, but there was a degree of clustering of households, with higher numbers of Chimunhu homesteads being found in the eastern section of the scheme, and more Mushati homesteads in the west of the scheme (see Figure 8).

The Gurajena and Chatsworth roads which ran through the scheme were important transport routes in Zimuto, and they almost converged at Maraire Business Centre. This was also the site of two District Council woodlots, the main Catholic church for Zimuto, and the Maraire Training Centre, the latter consisting of two buildings used for extension meetings, agricultural shows and as a meeting place for women's clubs and production groups. In the pre-independence era Maraire was an important focal point for development projects of various kinds, and this was still true in the 1980s, although to a lesser extent than before.

As in the case of Mutakwa, the "centralisation" policy initiated in the 1930s created lines of settlement and cultivation along the crests (toplands) in the landscape. However, a great many fields were found along the margins of the vleis. In Maraire this wetland cultivation was concentrated in 1988/89 around the vleis in the west and south of the scheme, and the vleis in the north and east were defined as grazing areas. The margins of the latter were not then cultivated, although there were clear signs (e.g. in the form of old contour drains) of them having been cultivated in the past.

Figure 8. Land use in Maraire grazing scheme



MARAIRE GRAZING SCHEME

ZIMUTO COMMUNAL LAND

Toplands within the grazing area made up some 40 percent of the area, and as in Mutakwa the dominant species were msasa (Brachystegia spiciformis) and mnondo (Julbernadia globiflora). There was little grass growth, and the invasive and unpalatable shrubs Lopholaena coriifola and Helichrysum kraussii were found in profusion.

Maraire was much more favoured than Mutakwa in terms of total land area per household (a mean of 12.1 ha as compared to 6.5 ha), and cultivated area per household (2.7 ha as compared to 2.1 ha). Maraire was regarded locally as a community with a better than average proportion of vlei land available to it for grazing and cultivation, and this is borne out in the estimates shown in Table 3.16. Vleis and drainage lines occupied 112.5 ha, or 15 percent of the total land area, somewhat more than the 10 percent found in Mutakwa. The main vlei in the grazing area was known as Musari vlei.

Table 3.16 Habitat patches available for grazing within Maraire grazing scheme in different seasons

	Wet season (ha)	%	Dry season (ha)	%
Reverted arable	122.5	21.6	122.5	16.6
Fields	0	0	147.8	20.0
Contours	0	0	8.6	1.2
Tolands	304.6	53.8	304.6	41.3
Vleis and drainage lines	112.5	19.9	112.5	15.2
Home sites	15.0	2.6	30.0	4.1
Riverine	12.0	2.1	12.0	1.6
Total	566.6		738.0	

The grazing scheme

Older residents of Maraire remembered the first demarcations of grazing land as having been carried out by state officials in the 1930s. Grazing management interventions were recalled as having begun in the 1940s, when the present boundaries between communities were demarcated by extension staff and gum trees (Eucalyptus spp) were planted as relatively permanent markers. A rotational resting system had been recommended and the grazing area was divided into three "paddocks", marked by lines of poles but without wire fencing. In the early 1970s the grazing was divided into five "paddocks", again demarcated by poles, and Short Duration Grazing was recommended. Rotations of two to three weeks per "paddock" were said to have been undertaken, the animals being herded in large groups.

An aerial photograph reproduced in Jordan (1964: 67) shows the upper portion of Musari vlei, and illustrates the range of

interventions being attempted by extension staff at that time (Figure 9). These included Eucalyptus plantations, fruit orchards, Turkish tobacco seedbeds, planting of the vlei to improved grasses, and pasture furrows planted to Napier fodder. The proximity of this portion of the vlei to the Gurajena road is shown in Figure 6. It seems likely that these were intended as trials and demonstrations, forming part of the extension and training programme and aimed at persuading visitors to Maraire from surrounding villages to adopt these innovations.

The woodlot and orchard could still be seen at the time of research. No Napier fodder survived, although the pasture furrows were still in place. Members of the scheme asserted that the area planted to "improved grasses"[10] still provided noticeably better grazing than the rest of the vlei. A dam for watering of livestock was found halfway down the vlei, and dated from the 1950s. After independence research workers from Makaholi Research Station planted trial plots of pasture legumes in the toplands in "Paddock 1" in Maraire; by the late 1980s these were in a state of neglect and it appeared as though the trials had ben abandoned.

The scheme did not operate during the late 1970s because of the liberation war, and was revived again in the early 1980s. A boundary dispute with Togara village to the south of Maraire was resolved with the assistance of Agritex staff. To achieve this extension staff made use of a map, probably made during implementation of the Native Land Husbandry Act in the 1950s, which showed the boundaries of the grazing areas. A boundary dispute with Mukengi village in relation to the top portion of Musari vlei was not resolved and in 1988/89 was still a source of tension.

The divisions between the five "paddocks" were no longer clear as a result of bush growth on the toplands, and in the mid-1980s community work sessions were held to clear lines through the bush and erect poles to show the boundaries. People also cleared Lopholaena coriifolia at these sessions, as routinely recommended by extension staff.

In the late 1980s, according to grazing scheme committee members, the scheme should still have been operated as an unfenced Short Duration Grazing system; rotations should have consisted of 14 days grazing per "paddock". The vlei area to the west of the community, near the railway line, together with the uncultivated land around the Business Centre and Training Centre, was said to be "paddock 6", and included in this rotational system.

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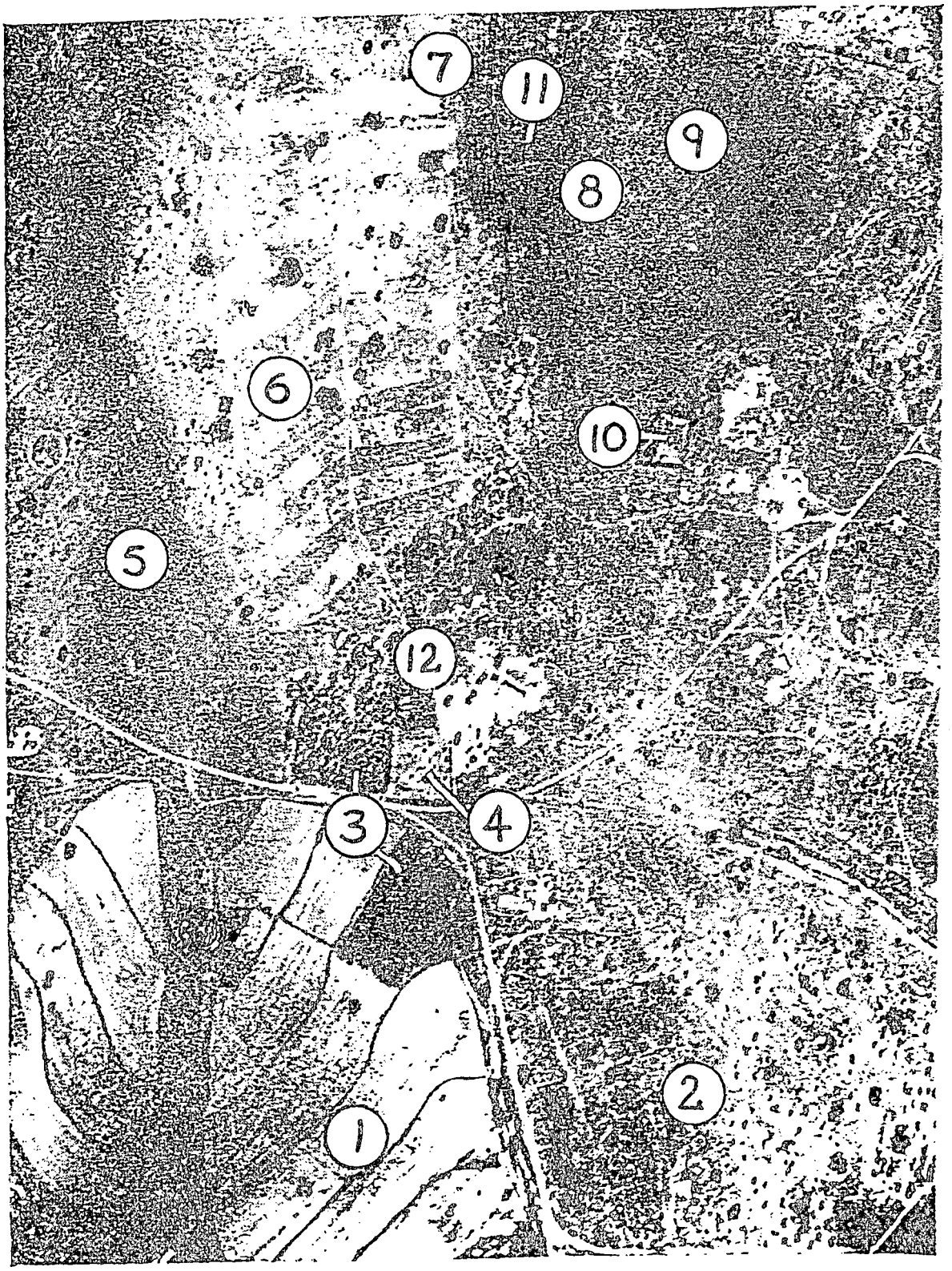
[10] It is not clear what species were planted.

Figure 9. Air photograph of upper portion of Musari vlei, Maraire grazing scheme, c1964 ((from Jordan 1964).



(1) Arable block, Mukengi kraal

(2) Reverted arable

(3) Eucalypt plantations

(4) Orchard

(5) Unimproved vlei (Mukengi)

(7) Pasture furrowing in grazing

(8) Vlei planted to improved grasses (Musari vlei)

(9) Pasture furrows planted with Napier Fodder and Dhal

(10) Vegetable gardens

(11) Tobacco seedbeds

Deferred grazing on vlei lands

In the period September 1988 to March 1990 no rotational system along these lines could be observed to be in operation. Instead a deferred grazing system was practiced, in which the upper section of Musari vlei in "paddocks 1 and 2", and the vlei lands in "paddock 6", were rested in the late wet season and early dry season and opened to grazing again after two to three months. In both seasons the deferment of grazing in Musari vlei was effective even in the absence of fencing, but was not effective in respect of the railway line vleis. In 1989 the reserved area in the west of the scheme was opened to grazing prematurely because the deferment rule was not observed by livestock owners in neighbouring villages, and in March 1990 "poaching" of this grazing by neighbours was said to be taking place.

The resting of Musari vlei in the late wet and early dry season produced what appeared to be a fairly plentiful reserve of dry season grazing in both 1989 and 1990. The lack of fencing, however, meant that this reserve forage was made use of by livestock owned by outsiders as well as Maraire members. In 1989 the reserve forage had been consumed after only two weeks of use and livestock in Maraire were then said to be "on free range" i.e. herding was no longer required. Informants predicted a similar pattern for mid-1990 after the opening of the reserved area.

Regular observation of livestock movement in Maraire showed that, as in Mutakwa, the vleis, drainage lines and riverine areas were habitat patches which were heavily utilised by animals. Detailed data on habitat use were not collected, but research assistants commented on how seldom livestock were observed in toplands. In the early dry season fields were an important source of forage in the form of crop residues and grass on contour banks.

Thus Maraire displayed some similarities to Mutakwa in respect of rangeland management, but there were some clear differences too: Table 3.2 shows that Maraire was more lightly stocked than Mutakwa, and that the stocking rate for the total land area within Maraire (3.6 ha per Livestock Unit) was closer to the rate officially recommended (6-8 ha per LU). This relative abundance of grazing land may have led to a degree of complacency amongst the members of Maraire.

Exclusion of non-members from vlei grazing was clearly more problematic in Maraire than in Mutakwa. Interviews with community members revealed that the lack of fencing was perceived to be the major problem within the grazing scheme. Maraire was known to have more vlei grazing within its boundaries than its neighbours, and than Mukengi village in particular. This inequality was the major underlying reason for the "poaching" of Maraire grazing by outsiders' livestock.

3.4.2 Socio-economic differentiation

The two kraals in Maraire, Chimunhu and Mushati, had long been closely associated and together formed one "community" in the eyes of local residents. There were many ties of kinship between the two kraals and settlement was not in clearly separate zones. Chimunhu kraal contained 42 households and Mushati 21, a total of 63 households.

In contrast to the other case study schemes there were generally high levels of grain production in Maraire, and the distribution of total grain production within the community was not as highly skewed (Table 3.4 above). These features are probably explained by favourable and reasonably equitable access to productive fields in vlei margins. Two thirds of all households owned cattle, and this was the highest proportion among the five case study schemes.

Nevertheless, socio-economic differentiation was evident in Maraire too. Sales of maize, the main crop, were highly skewed. Only 48 percent of households sold any maize in 1987/88, and 20 percent of households sold 72 percent of all the bags sold. Cattle ownership and maize sales were strongly associated, as shown in Table 3.17. Large herd owners sold an average of 18.5 bags of maize, more than three times the number sold by owners of 1 - 9 cattle. Cattle holdings were again more strongly correlated with crop production and asset holdings than the variables of gender of household head or presence of wage workers.

Table 3.17 Maize hectarage, maize sales and cattle ownership in Maraire 1987/1988

	Cattle ownership			
	0 cattle (n=20)	1-9 cattle (n=30)	10 or > cattle (n=11)	ETA
Hectares under maize (mean)	0.5	1.1	1.2	0.53
Maize sales in bags (mean)	1.0	5.2	18.5	0.64

Thus in Maraire there were significant disparities in cattle holdings and crop production, although this pattern of differentiation was less marked than in nearby Mutakwa. The large herd owners tended also to be the successful crop farmers, and thus constituted a wealthy elite. Table 3.7, however, shows that the effects of this inequality may have been blunted to a certain extent by inter-household interactions: households with inadequate numbers of draught animals tended to borrow these from their relatives; there was much less hiring of draught power than in Mutakwa.

There appeared to be fewer internal tensions within Maraire than in Mutakwa. There were said to be strong ties of kinship between families, and a great deal of socialising at beer drinks took place. These were also occasions on which community leaders discussed important issues such as the dates on which herding of livestock or deferred grazing should begin and end.

3.4.3 Institutional arrangements and power relations

The grazing scheme committee

The grazing scheme committee was first elected in 1973, and few changes in its composition occurred between that year and 1990. After independence the same committee was formed to revive the scheme. William Maraire was given the post of chairman in 1984 when he became acting sabhuku, at an election meeting attended by a majority of community members. Dissatisfaction with his leadership led to the reinstatement of the pre-independence chairman, Tauya, in 1988.

The sabhuku for Mushati kraal was asked to be on the committee in 1984, but declined because of his age. The sabhuku for Chimunhu in the period of the study was not formally a member of the committee, but was said to be always consulted when important decisions were made. Between 1988 and 1990 there appeared to be no tensions between the masabhuku and the committee. Of the five members of the committee, three were from Chimunhu kraal and two from Mushati kraal, but informants attached little significance to this.

The most authoritative and influential member of the committee was the secretary, Tongofa, who had occupied this post since 1973. Tongofa lived not far from the upper portion of Musari vlei and played an active role in "policing" the deferment of grazing which was practiced there, a far more active role than the designated mupurisa of the scheme. Even the chairman of the scheme deferred to Tongofa. He was also the secretary of the VIDCO. The vice-chairman of the grazing scheme committee also sat on the VIDCO.

In 1985 members of the committee visited grazing schemes in Mwenezi District, an expedition organised by the local Agritex Extension Worker. Some of the transport costs were met by community contributions. Committee members also attended a 2 week training course on grazing management run by Agritex in the same year, and the course included a discussion of grazing scheme by-laws.

Masabhuku

The two masabhuku within Maraire at the time of research were Vaki Chimunhu (Chimunhu kraal) and Garike Ruzengwe (Mushati kraal). The former succeeded his father as sabhuku in 1984, but was working in Bulawayo at the time and appointed his brother William to act in his place until 1988 when he returned to live at home. Garike was appointed in 1943 by the sabhuku for

Chimunhu, because the recently deceased incumbent, who was Garike's father-in-law, had no sons. Garike remembers the time when homesteads belonging to the two kraals were located close together in the area between the two roads, before the "lines" were formed. By the late 1980s he was an old man and no longer active within the community.

The VIDCO

Maraire, together with the neighbouring kraals of Kwanga and Mukengi, fell within VIDCO 6. The VIDCO chairman was William Maraire, brother to the sabhuku of Chimunhu kraal, and until 1988 the acting sabhuku. The VIDCO was not perceived locally as being an effective planning or decision making body. Only two development projects had been initiated by the VIDCO in recent years: a woodlot, and improvements to the Maraire Training Centre. The woodlot was small and not well maintained, and the Training Centre improvements had been left half-completed for over a year by March 1990, and there was no evidence of any enthusiasm for its completion amongst local residents. Many people in Maraire were not aware of who sat on their VIDCO, and some dismissed it as a weak and ineffective institution.

Grazing scheme by-laws

The by-laws put forward by Agritex at the training course attended by committee members in 1985 placed great importance on Short Duration Grazing, and included the stipulation of fines for fence cutting. According to committee members there was no mention of a maximum stocking rate. Since by 1990 Maraire had not received any donor funding, a formal set of by-laws had never had to be adopted as a pre-condition for financial assistance.

Some members of the committee claimed that a set of by-laws had been agreed within the community, but there was no consensus as to their contents. When first interviewed on this issue in 1988, the scheme's secretary, Tongofa, maintained that the Committee had drawn up its own set of by-laws in 1986 and put them forward for community discussion and acceptance at a general meeting. Tongofa's version of the by-laws stated that rotations should be followed, and Lopholaena coriifolia shrubs weeded at regular work sessions, with fines of 50c for non-compliance. William Maraire's version included compulsory rotations, but not fines; instead uncooperative members should give an account of themselves to the committee. He also mentioned that certain areas of the grazing had to be reserved for the production of seed. His version included the prohibition of grazing by outsiders' livestock as a by-law.

The chairman and vice-chairman of the scheme could only remember one by-law each when questioned on this issue; in both cases this was the rule making the following of rotations compulsory. In all these different versions of the by-laws the rotations were said to refer to 14-day grazing periods in each of the five "paddocks". However, there was a sharp contrast between the rules regulating rangeland use which were said to operate and those

which were actually followed. As described above, Maraire practised deferred grazing on portions of the vlei grazing, not Short Duration Grazing on the whole of the grazing area. As in Mutakwa, the timing of the closure of these portions depended on rainfall, and duration depended on the amount of forage available in the rest of the scheme in the late dry season.

External authorities

State officials and agricultural extension staff have always played a central role in the history of Maraire grazing scheme[11]. The demarcations of grazing land which created the Maraire scheme were carried out by extension staff in the 1940's, and deferred grazing may well have been practised, under their supervision, before then. Musari vlei was the site of many official trials and demonstrations in the pre-independence era. Mupandawana, the Extension Worker who lived in Maraire, had worked in the area for 22 years by the time he left in 1988, and had been a key figure in initiating the SDG scheme in the the early 1970s and in reviving the scheme after independence. In the 1980s the Training Centre at Maraire was often used for extension meetings and field days, and on these occasions senior officials often urged farmers to practise grazing management.

After the departure of Mupandawana there was no Extension Worker in the area for four months. His replacement, a newly qualified young woman, was perceived as a much weaker extension presence in Maraire, and this was much commented upon by informants. It was sometimes offered as an explanation for the "lack of progress" in the scheme, for the inactivity of the local Farmer's Club, and for the small number of meetings held.

Even Mupandawana, however, was said by one member of the Committee to be "toothless" (ineffective). The example offered was his inability to secure for Maraire both the bull and the rolls of fencing wire said to have been won in a conservation competition in 1985. The non-arrival of these contributed to a rankling feeling amongst many residents that the scheme had been sorely neglected by government officials.

The lack of fencing in Maraire was a particularly sore point with residents. People expected the scheme to be provided with fencing, from either donors or government, since "we have and will put all our efforts to reserve our grazing areas", as one committee member put it. However, the grazing scheme committee made few efforts to actively secure this kind of support. Both ordinary members and the committee evidenced an attitude of passivity, on the one hand, and a muted resentment of the perceived neglect of Maraire, on the other. The lack of fencing was often pointed to as a sign of the ineffectiveness of the

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[11] According to Garike the name "Maraire" itself was originally that of the white local government official who enforced the centralisation policy in the 1930's, and means "the one who gives laws".

local Councillor, but he had not been called to meetings to hear these complaints or to be asked to act more positively.

The power elite of Maraire

As noted above, there was a degree of overlap in the composition of the VIDCO and the Grazing Scheme Committee, and the sabhuku for Chimunhu (the senior kraal) was often consulted when important decisions were being made. The dare (court) of the sabhuku was used to hear cases of violations of grazing scheme rules. The leadership layer in Maraire, as in Mutakwa, thus constituted a local "power elite", but this power appeared to be exercised only sporadically and to relatively little effect. This elite did not engage in much "development-oriented" activity, either on their own behalf or in the interests of the wider community. The grazing scheme committee did not meet often, and the question of when to begin the resting of grazing land was discussed informally on social occasions such as beer drinks, and then acted on by the secretary, or sometimes by the secretary and the chairman together.

The mean size of cattle holdings of committee members in 1987/88 was 6.2, higher than the mean for Maraire as a whole (4.8), but less than the mean for cattle owners only (7.1). Only one of the five committee members, the treasurer, belonged to the group of 11 large herd owners in the community; there were no non-owners on the committee. The secretary, Tongofa, a retired worker, owned 6 head of cattle. The sabhuku for Chimunhu kraal was a large herd owner, with 13 animals in his herd.

Most of the cattle wealthy in Maraire were not active in local politics. Of the 10 bona fide large herd owners[12], 4 were absent most of the time in wage employment, returning home either at weekends or at the month's end. One operated a local grinding mill in addition to working in Harare. The other 6 were all retired workers, and while they had probably invested part of their earnings in cattle, only one, the sabhuku for Chimunhu kraal, participated actively in grazing scheme affairs. Four of the large herd owners held positions in local ZANU(PF) structures, but these appeared to be dormant, and played no role in decision making on land issues in Maraire, in the period under review.

The most active ZANU(PF) member in Maraire in this period was Chakaita, chairman of the local branch of the Youth League. Chakaita was involved in a number of disputes with both community leaders and the Agritex Extension Worker, Mupandawana, which reveal some of the underlying dynamics of power in Maraire. In particular, they demonstrate the weakness of the Maraire

[12] One women who was head of her household held 4 cattle in her kraal, with 7 head held elsewhere and still to be delivered in terms of a roora agreement. All the cattle were said to be "owned" by her son, who was regarded as a member of the household even though he lived and worked in Harare.

leadership group when confronted with situations of internal conflict, and its passivity in relation to external authority.

3.4.4 Key actors

Who were the key actors, and what were the most important social identities, within the common property regime? In terms of community social structure, it was relevant to a certain degree whether or not households owned cattle, but the size of their herd appeared to be less important. Unlike other schemes, kraal membership appeared to be of little relevance.

In relation to local power structures, the sabhuku of Chimunhu kraal played a central role in the scheme, as did members of the grazing scheme committee, the secretary in particular. Also important was the chairman of the local branch of the ZANU(PF) Youth League. Cattle owners from the neighbouring villages of Mukengi and Nguwo became key actors too. As far as external power structures were concerned, Agritex extension staff for the area and the District Councillor were most involved in the affairs of Maraire.

3.4.5 Patterns of interaction and struggle

Challenges to the power elite

In November 1988 Chakaita and Mupandawana were involved in a complex but violent dispute which led to the Extension Worker being transferred to another area. Chakaita's actions were widely deplored by local residents, who saw them as resulting in the loss of their most direct channel to development funds and assistance. The Maraire leadership also expressed their resentment of Chakaita, who, they said, had no respect for authority, but they undertook no disciplinary measures, and left the matter in the hands of state officials. Chakaita was eventually forced by the Provincial Governor to make a public apology at a large field day.

In 1988 and again in 1989 Chakaita flouted the land allocating authority of the sabhuku and the VIDCO by twice negotiating the sale of his homestead and fields to outsiders, for large sums of money. Although neither transaction was completed, Chataike did not follow what many local residents described as the "correct procedure". This involved introducing the prospective entrant to the community to the sabhuku, who would then give his approval and "witness" the sale. On other occasions Chakaita attempted to have community meetings and farmer training courses cancelled, claiming that "the Party" had not been consulted.

In April 1989 the secretary of the scheme, Tongofa, discussed the policing mechanisms which ensured that deferred grazing rules were observed. He used as an example an occasion when Chakaita had put his donkeys onto Musari vlei at a time when it was reserved for winter grazing. Tongofa had warned Chakaita that if he repeated the offence then "steps would be taken against him". Tongofa did not mention the possibility of a cash fine being

imposed, and could not specify what these "steps" might have consisted of.

While Chakaita felt he could flout local "laws" with relative impunity, he did not try to organise an faction to oppose the leadership group, and the leadership did not feel unduly threatened by Chakaita. On the other hand, he also demonstrated the relative weakness of the leadership and its inability to impose effective sanctions on those who disregard local norms and by-laws. The leadership relied on external authority to discipline Chakaita.

Deferred grazing in 1989

On the 1st March 1989 the upper portion of Musari vlei, part of what was known as "Paddock 1", was declared to be reserved for winter grazing. According to the chairman of the scheme, Tauya, he and the secretary, Tongofa, made this decision: "we are the decision makers here" he declared. The masabhuku, he said, would help to "push people" to use paddocks in the correct way. The closure took place later than usual, said Tauya, because of the lateness of the rains; early January was usually the period in which the deferred grazing system began to operate. The vlei would be rested for three months.

The main problem that the chairman anticipated was the invasion of the reserved grazing by outsiders, particularly herders from Nguwo and Mukengi kraals. They might put their animals onto the vlei at night, or wait until after the grazing was declared open again.

Tauya affirmed the importance of having a grazing scheme committee, but also expressed some personal dissatisfaction with his role as chairman and a desire to resign:

> Our people are unhappy because they won prizes in previous years but never received them. They blame the chairman for this. People have been made to work in paddocks, but get no rewards. Without fencing wire it is very difficult. In the long run people may not co-operate (Tauya 1/3/89).

The vice-chairman of the committee, Muchova, outlined the difficulties the committee faced in their attempts to enforce grazing scheme rules:

> Our main problem is with the Mukengi people. Someone from there went into Paddock 2, and we had to sit down with them and discuss it. But they continue to do it; without a fence it is a continuous problem.
>
> People within Maraire have a liking for paddocks, so they all obey our laws. Paddocks help in that areas are reserved for cattle. We have worked for the past two years to clear the lines which demarcate the paddocks. Many people came to these work sessions. We

> used to make the non-attenders pay a 50c fine, but now people are disappointed; we have long been promised some wire but nothing ever comes. People are quite disheartened but due to the committee they just carry on (Muchova 1/3/89).

By mid-April herders from Maraire were putting their animals into fields to feed on crop residues, and Musari vlei remained ungrazed, although cattle from Mukengi were reported as "breaking in" at night. By mid-May many fields had been winter ploughed, and cattle were relying on vleis, fallow fields and contours to provide fodder, but the grass in these areas was said to be "very short". A good reserve of grazing, however, had built up in Musari vlei.

On 1st June Tongofa declared Musari vlei open for grazing again, after the planned three month rest period. Maraire residents were informed on the evening of 31st May, and took their herds to Musari the following morning. On the 2nd June their livestock were joined on the vlei by animals from neighbouring kraals. A research assistant estimated that between 450 and 500 head of cattle, and about 150 sheep and goats, from Maraire, Mukengi and Nguwo, were grazing the vlei on this day. By the middle of June, after two weeks of use, the grazing reserve in Musari vlei had all been consumed, and Tongofa announced that herding of livestock was no longer necessary in Maraire.

Deferred grazing in 1990

In early January 1990 the secretary expressed his hopes and fears for the grazing scheme in the coming year. He had misgivings about the planned deferment of grazing on Musari vlei, and foresaw a decline in the effectiveness of the system:

> I will call a committee meeting at the end of January, when our area might have received some good amount of rainfall, to try to reserve Musari. But people are discouraged since it is so hard to control poaching by people within the scheme and by neighbours when we have no wire to protect our grazing (Tongofa 4/1/90).

On the 26th January Tongofa announced the closure of Musari vlei together with the vlei and reverted arable near the railway line, in "Paddock 6". Whereas the previous January had been very dry, this January had seen heavy rains falling in the two week period immediately preceding the closure.

On the 17th February the mupurisa for the scheme, Mariba, called an emergency meeting of the committee together with sabhuku Vaki Chimunhu. Three boys from families within Maraire had been apprehended grazing their cattle herds in the reserved grazing in "Paddock 6". All three families owned herds of less than 5 animals; none were part of the leadership group.

A meeting of the dare was called, with Chimunhu presiding over the proceedings. At first the boys maintained that they knew nothing of the closure of the grazing in this area, but after Tongofa threatened to make them pay a $5 fine, and in addition have them brought before the magistrate's court in Masvingo, they admitted to wilfully disobeying the deferment rule, and apologised. The dare gave them a "final warning", and Chimunhu stressed that any future violations of the "law" would automatically result in $5 fines.

On the 20th February Chimunhu complained again about poaching of grazing by herders from Mukengi. He said that the grazing was in good condition after the recent rains, but that poaching was proving troublesome along the railway line in particular. The scheme had had no success in procuring any fencing materials from the District Administrator, because, he said, the Councillor had done nothing to help. "We used to rely on the previous Extension Worker, Mupandawana", said Chimunhu.

By mid-March the late summer rains had come to an end and grazing was once again in short supply. The portion of "Paddock 6" in the vicinity of the Business Centre was opened up for grazing first, on 7th March. Musari vlei and the area along the line of rail was left closed, and the Committee decided to enter the scheme in the Provincial Conservation Competition which was announced by extension staff at a grazing management field day held in nearby Masimba Grazing Scheme on the 13th March.

Cooperation and non-cooperation

Between 1988 and 1990 the leaders of Maraire sometimes represented themselves as operating an unfenced Short Duration Grazing system, in line with official Agritex recommendations. It became clear, however, that the reality was one of a relatively effective deferred grazing system centred around the key resource of vlei grazing.

Deferred grazing was effective to a certain extent despite the absence of fencing because of broad acceptance of the most important rule or by-law (the closure of certain areas of grazing), both within the community and without. The grazing scheme committee exerted sufficient authority to ensure that relatively few violations of this rule occurred in respect of Musari vlei.

However, the committee's weakness was displayed in its inability to prevent invasion of Maraire grazing by neighbour's livestock, during the period of closure in respect of "Paddock 6", and after this period in respect of Musari vlei. Despite fears by the leadership that these invasions would lead to the eventual collapse of the deferred grazing system, it was unable to secure external support for its project of fencing the boundaries of the scheme.

The committee's shortcomings were evident in other ways too; it met seldom, delegated most decisions to the most charismatic

individual within the group (the secretary), and was unable to impose sanctions on powerful individuals within Maraire who violated the deferred grazing rule. The community leadership relied largely on external authority to discipline a recalcitrant Maraire resident, Chakaita.

Thus most of the antagonisms generated by the grazing scheme were focussed on the boundaries of the scheme, but some internal lines of fracture could also be discerned, if less clearly. Local power holders identified non-cooperation as a problem threatening resource management mainly from the outside. However, their relative weakness in relation to government and donors, on the one hand, and with regard to the mobilisation of community support for development projects, on the other, was also evident.

3.4.6 Outcomes

In the 1980s large herd owners in Maraire, in contrast to those in Mutakwa, were not particularly active in the grazing scheme committee. They appeared to pay more attention to their wage earning, business and cropping interests than to livestock and grazing. Since Maraire was a relatively well-endowed community within Zimuto in terms of vlei land for both cropping and grazing, this may have led to a certain degree of complacency amongst these wealthier households, and more generally within the community. The existing property regime may have been perceived as operating sufficiently effectively for greater involvement in grazing scheme affairs not to be necessary. However, if land use planning by state officials were ever to re-allocate large areas of vlei grazing to neighbouring communities, then it appeared possible that this attitude of passivity might well undergo change.

In the first decade of independence the legacy of the colonial past seemed to hang over Maraire. Even the meaning of its name ("one who gives laws") evoked the era of state imposed plans and compulsory "development". The ruins of the old tobacco sales building, and the empty contours in the grazing area which once grew stands of Napier Fodder, testified to the failures of this era. Some components of state planning survived, however - for example the old gum trees marking out grazing territories, and perhaps most notably, the deferred grazing system on Musari vlei. Another survival, less positive in character, was a legacy of passivity in relation to external authority and government agencies.

The grazing scheme in Maraire was clearly more than simply a "minimum" common property regime, since there were definite rules in place for the use of vlei grazing at certain times of year. These rules were articulated and enforced by an institutional structure which had its roots in the colonial period, and there had been little innovation (and indeed little change in personnel even) over the past twenty years. Maraire grazing scheme had thus developed what might be termed an "adequate" institutional capacity, but had been unable to adjust to the demands of the post-independence situation.

New pressures were experienced in this period: "poaching" of grazing by neighbours had become a major problem, and Maraire residents felt that fencing was needed to exclude outsiders. Other grazing schemes had received donations of fencing from donors and government: why not them? But the scheme leadership had not cultivated the necessary political connections (e.g. with the local Councillor), and the committee felt sorely deprived when its strongest link with the state bureaucracy, the local Extension Worker, suddenly moved away. Land use planning initiatives by the post-independence government was threatening to change village boundaries, but Maraire was in a weak position to resist re-allocations of grazing land to neighbours.

Thus it seemed likely that the members of Maraire grazing scheme would sooner or later be forced to accept changes in their property regime. The leadership would have to develop new capacities (e.g. to argue their case with external authorities, to negotiate changes in scheme boundaries, and to organise community support for new grazing management rules and their enforcement), or face a decline in the effectiveness of common property arrangements on their grazing land, and possibly even their extinction.

3.5 MWENEZI DISTRICT SCHEMES: THE ECOLOGICAL AND INSTITUTIONAL CONTEXT

Mangezi and Machingo grazing schemes were both located within Mwenezi District in Masvingo Province, and were immediately adjacent to one another. Their origins lay in a high profile land use planning initiative within the district known as the Mwenezi Radical Land Reform Programme (MRLRP), and in the late 1980s they fell within the same Village Development Committee (VIDCO) area. This section describes the shared ecological and institutional context of these two case study schemes.

The "radical land reform programme" initiated in Mwenezi District in the early 1980s soon caught the imagination of donors, planners and journalists. It was referred to in the press as "one of the most radical advances in communal farming since the plough" (Sunday Times 17/11/87). However, problems as well as successes were experienced. By 1990 the spread of the programme through the district had slowed and the MRLRP had lost its high profile as a successful grassroots land reform initiative.

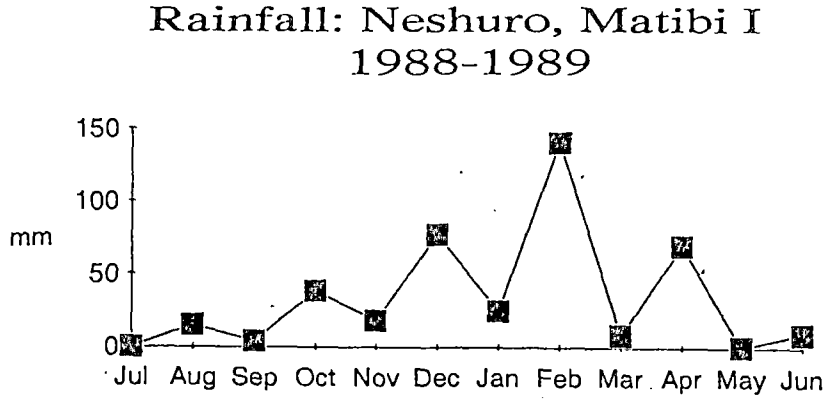
The case studies of Mangezi and Machingo illustrate the nature of the problems encountered. Although the rhetoric of the MRLRP stressed its popular, "bottom up" character, in reality the planning and implementation of resource management in these two communities was little different from conventional, "top down" approaches. In addition many difficulties were experienced as a result of attempting to implement an SDG grazing system in a semi-arid environment with highly variable rainfall. These were exacerbated by high population densities (of both people and livestock), which left little room for manouevre.

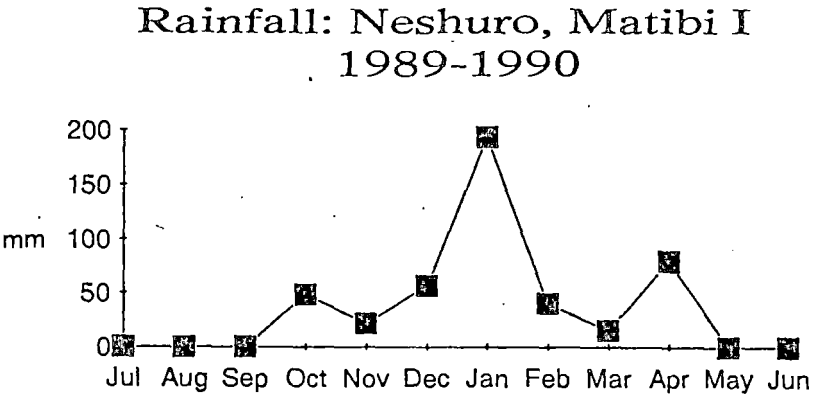
3.5.1 The ecological context

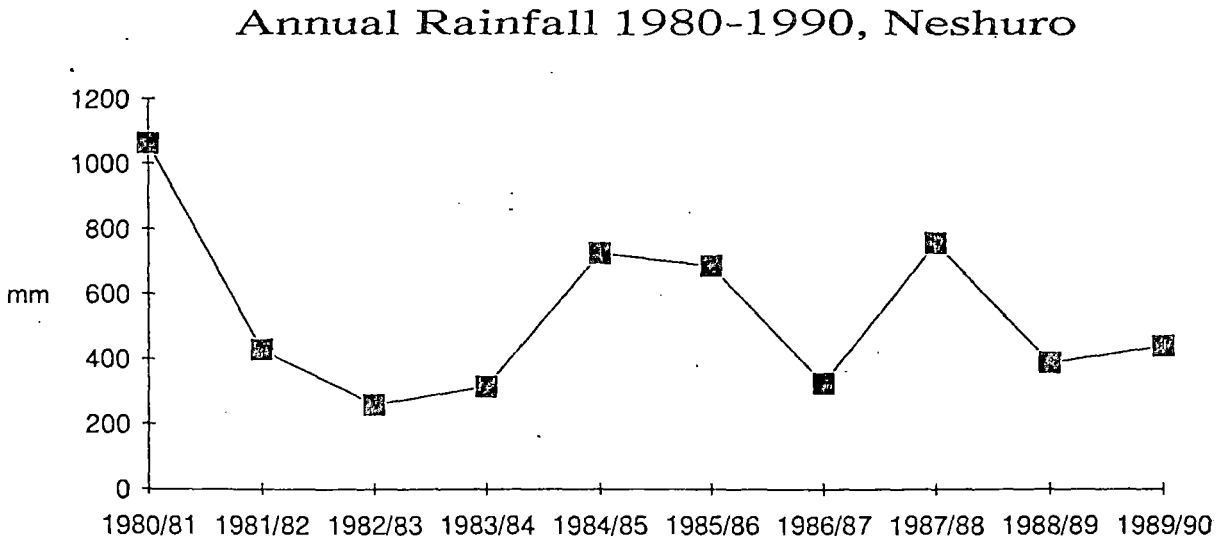
Location and population

Mwenezi District is located in the dry south eastern lowveld of Zimbabwe. Most of the District falls within Natural Region V, but a portion in the north with higher rainfall is classified as Natural Region IV. During the period of research most of the land in the district (83 percent) was held as large scale commercial ranches. The Communal Lands of Maranda and Matibi I made up the rest of the district. The population of the Communal Lands was approximately 73 300 in 1982 (SADCC 1986: 2/1). The commercial ranches contained a much lower population of people (approximately 10 000 in 1982) and livestock, at much lower stocking rates than on the Communal Lands (Cliffe 1986: 65).

Figure 10. Rainfall at Neshuro, Matibi I







Rainfall

Mean annual rainfall at Neshuro recording station in Matibi I between 1980/81 and 1989/90 was 538.3 mm. Rainfall varied considerably from year to year, both with respect to total amount and seasonal spread, and mid-cropping season droughts were common (see Figure 10).

Soils and vegetation types

Mangezi and Machingo are located in the portion of Matibi I which falls within Natural Region IV. This area falls in a transition zone between broken granite country to the north and the flat, fertile mixed bushlands of the south east lowveld. There are many domed hills and castle kopjes interspersed with gently sloping areas and thickly wooded river valleys.

Vincent and Thomas (1962: 92) describe the vegetation of those parts of the south and south east of Zimbabwe which fall within Natural Region IV as belonging to three basic types:

(a) The vegetation of the granite sand areas is characterised as "mixed deciduous Terminalia-Burkea woodland". Colophospermum mopane is found scattered throughout and is dominant in areas of poor drainage. The grasses are described as "mainly 'sour', poor species, but with some more palatable ones mixed in the sward" (ibid: 92). Examples are Eragrostis spp, Digitaria spp, Cenchrus ciliaris and Aristida spp.

(b) On loam soils the vegetation is characterised as "very mixed, with general co-dominance of Combretum apiculatum and Acacia nigrescens" (ibid: 92). Grasses include Themeda triandra, Eragrostis spp, Cenchrus ciliaris, Urochloa spp, and some Panicum maximum, and these are mostly palatable and of high value as grazing.

(c) On the heavier red clay soils Vincent and Thomas describe the vegetation as "Acacia-other species bushland", dominated by Acacia spp, mainly Acacia karroo. Grasses in these areas comprise many species (e.g. Heteropogon contortus, Themeda triandra, Eragrostis superba, and Digitaria spp), and where soils are deep a good sward of Panicum maximum and Urochloa pullulans and other good grazing grasses can be found.

In 1988/89 the vegetation of Mangezi and Machingo fitted into this general typology. The grazing areas were mostly on sandy loam soils and contained a mixture of Terminalia sericea, Combretum apiculatum and Acacia spp. These areas contained a mixture of species of poor to moderate value for grazing (e.g Digitaria spp, Sporobolus spp), and highly productive grass species (e.g. the prized Urochloa mossambicense, known locally as 'mbavani'). Patches of sodic soils dominated by Colophospermum mopane were found throughout the grazing areas.

Two rivers border Mangezi and Machingo, the Shashe and the Chivakhe (see Figure 11). Adjacent to these lay a zone of high level alluvium with red loamy soils. In the past portions of the alluvium had been cultivated, but land use planning carried out under the MRLRP had converted these into grazing areas. The woodland in these red soil zones conformed broadly to the third vegetation type described by Vincent and Thomas. Tree and shrub species of high browse potential were found (e.g. Combretum fragrans, Dichrostachys cinerea, Grewia flavescens), and the dominant grass species was the productive Urochloa mossambicense ('mbavani'). Patches of Panicum maximum also occurred, particularly under trees.

Spatial heterogeneity

Heterogeneity of grazing resources was found within these two grazing schemes in respect of two zones with contrasting characteristics. Most of the paddocked grazing area was located on sandy loam soils with sodic patches, and both the quantity and quality of grazing here were poor to medium. Higher quality grazing and good browse species were found in the red soil alluvium zones alongside the rivers.

Within these zones a certain degree of heterogeneity was also found, and distinct habitat patches could be identified. Drainage lines within the mixed woodlands on sandy loams appeared to produce more grazing than did the surrounding areas. Within the alluvium zones there was a contrast between the densely wooded river banks and the more open mixed woodland further back.

In the past livestock owners exploited spatial variations in rainfall and vegetation at a much larger scale, along the lines described by Scoones (1989; 1990). In drought years herds in search of grazing were often taken as far afield as Matibi II and Sengwe Communal Lands in the south of the district, and sometimes left there under kuronzera (loaning) arrangements until conditions had improved. When Foot and Mouth Disease control measures were introduced in southern Zimbabwe in 1984, and movement across zones was restricted, some people from Matibi I had to abandon their plans to bring herds of cattle back from the south after the end of the drought. They were forced to either sell their herds and buy other cattle or come to some kind of "mutual aid" arrangement with households looking after these animals. Some people are said to have permanently moved their homes to these southern Communal Lands to be with their herds.

3.5.2 The institutional context: The Mwenezi Radical Land Reform Programme (MRLRP)

Programme objectives

The "land reform" programme which began to be formulated in 1982 and 1983 consisted largely of a reorganisation of land use within the Communal Lands, not a redistribution of land from commercial

to communal. The major emphasis in the programme was on livestock production.

Cliffe (1986: 63) has succinctly summarised the main components of the MRLRP as:

> i) re-establishing demarcated grazing areas that had been encroached upon as households dispersed during the war... and introducing village management of the grazing, using fenced paddocks
>
> ii) putting greater emphasis not only on herd improvement but on livestock production as the main source of cash income
>
> iii) consolidating arable holdings into blocks but reducing total area thus in turn reducing the need for draught
>
> iv) catering for the needs of the stockless by giving them rights in grazing areas, encouraging the spread of the traditional custom of lending out cattle for the use of those herding them, and by promoting co-operative use of draught animals on neighbouring plots in the village block
>
> v) establishing more centralised villages between grazing and arable areas (Cliffe 1986: 63).

Since in many respects the MRLRP appears to have amounted to little more than Native Land Husbandry Act planning with popular consent, one can ask: why the epithet "radical"? As the 1986 SADCC study pointed out:

> The MRLRP is perceived by some as the continuation of old policies and schemes - slightly embellished, perhaps; by others as a "radical reform", a "social transformation".
>
> The former group point to pre-war grazing schemes.... the latter to equalisation aspects and communal management of common resources (SADCC 1986: 5/1).

According to Cliffe (1986: 64) the two features of the programme with most general relevance were firstly, "the communal commitment developed from processes of grassroots discussion" i.e. its popular character, and secondly, the measures aimed at assisting the non-stock owning households. Central to the MRLRP, and the feature which has been most often stressed, was the institutional dynamic whereby a "communal commitment" was said to being generated.

Institutional structures

For the first decade of independence the Batanai District Council represented the population in Maranda and Matibi I. The Council was headed by a Chairman and Vice-Chairman elected from the ranks of Councillors.

The key role envisaged for the Councillors in the MRLRP was summed up in a 1983 planning document:

> ... it is the Councillor who is responsible for introducing the concept of land reform and social transformation within each ward, and thus his catalytic and organising role is extremely important (DPP 1983: 3).

Before 1984 and the creation of VIDCOs and WADCOs the Councillor operated within the ward through the so-called "Ward and Village Standing Committees". These were not elected bodies, and were structured to include representatives of various interest groups within the ward (DPP 1983: 3). They were constituted from above by local government officials working together with the ruling party. They appear to have been composed largely of members of the local elite, such as kraalheads (masabhuku), businessmen, headmasters, local party officials, and master farmers, as well as extension staff from government departments. In the mid-1980's these bodies fell away and were replaced by VIDCOs and WADCOs. The Councillors continued to be directly elected and to be the key linkage between Council and its constituency.

In Mwenezi the ruling party, ZANU(PF), appears to have played a particularly active role in post-independence initiatives, perhaps because of its high profile in the area during the last few years of the liberation struggle. In Ward 14, for example, where the MRLRP was said by some local informants to have originated, the Councillor and Village Standing Committee Chairman were both active and leading members of the "liberation committee" formed to assist the guerillas (Sanders 1984).

Beginning the MRLRP: an "educational war"

The key figures in the early stages of the programme were the District Administrator (DA), K. Mugoni, and the new Councillors elected in 1982. Particularly influential were the first Chairman of Council, Francis Christmas, and the Chairman of the Planning Committee, Phineas Sithole.

The SADCC report of 1986 provides the following account:

> The policy was one of "soft selling". The sensitivity of people to relocation, to land reorganisation, to cattle controls, to conservation disciplines, was taken into account....
>
> The informal planning group of DA and a few councillors set out to share their ideas, using village standing committees....Simultaneously they enlisted the support of the technical staff...some of whom had in any case contributed to strategy formulation. Bringing the village leaders and the technicians together, motivation of the people soon had its effect in one ward (No. 4) (SADCC 1986: 3/1 - 3/3).

According to the SADCC report the role of party activists was described by local informants as "... being not without an element of threat, coercion - the 'hard sell'" (ibid: 3/3). The District Administrator's document of 1984 asserts that "After the leaders understood an educational war was then switched on to the masses ..."(Mugoni 1984: 3).

Implementation of the programme started in a small number of pilot wards, the first two being the constituencies of the Chairman of Council (Ward 4) and the chairman of the Planning Committee (Ward 14). Within these wards the programme began to be implemented in the home villages of these two highly influential individuals. The MRLRP was thus a programme conceived and planned by a small group of officials and members of the district elite rather than a grassroots initiative.

The MRLRP and land redistribution

From its inception the MRLRP faced a fundamental dilemma. Given a history of forced relocation of rural communities into densely settled "reserves" in low potential areas, it was unlikely that the kind of land use reorganisation proposed by the MRLRP could by itself resolve the problems faced by Communal Land households.

I have noted above the stark contrast between human and livestock populations in the commercial and communal sectors within the district. Livestock numbers declined sharply in Matibi I and Maranda during the 1982-84 drought, and the situation thereafter was one of much-reduced stocking rates on communal grazing. While this gave comfort to extension officers and planners who were worried about "overgrazing", it left many households without access to sufficient animals for draught purposes, and undermined the notion put forward by planners of building a local agricultural economy based on livestock sales. The obvious imbalances led to calls for "external" resettlement as a necessary complement to "internal" land reform within the MRLRP (although the latter were always given greater prominence).

Cliffe calculated that the two Communal Lands could hold a total of 14 350 LUs, at stocking rates of 1 Lu per 10 ha, but that this would provide only 1.2 LU per household. According to Cliffe

> ... [there is] no marked shortage of arable land for household needs, nor of grazing for the number of available livestock after the drought. But these 'balances' are not enough to give all households enough draught animals or to give them sufficient herds to make a living.... there is a poverty not a conservation problem (Cliffe 1986: 64).

Cliffe went on to conclude that substantially expanded access to grazing land <u>outside</u> the confines of the present Communal Lands was critical to the success of attempts such as the MRLRP to undertake "internal" transformations. The Chairman of the District Council, Francis Christmas, continued to raise this issue throughout the 1980's, in Council meetings and at public

gatherings, but no programme along the lines recommended by Cliffe had, by 1990, been proposed by government. As it took shape the MRLRP remained to all intents and purposes a programme of land use planning with little or no attempt to radically alter the pattern of access to resources across sectors.

Implementation record

The MRLRP was formally launched in 1983 when the land use planning of 6 villages in 3 pilot wards (numbers 4, 14 and 23) was carried out by Agritex officials. Funding was sought from two donors, the EEC Micro-projects Fund and GTZ, who were working closely with the ARDA Provincial Planning Unit. A project budget of Z$ 241 018 was agreed, with the EEC and GTZ providing Z$ 72 912 each and the local community and government departments providing labour and services estimated to be the equivalent of Z$ 95 180. All of the GTZ grant and an initial payment of Z$25 000 of the EEC funds were released in early 1984.

Fencing of paddocks and relocation of households and fields commenced in 1984. Members of the schemes were transported by the District Administrator's office to commercial ranches within the district to cut fencing posts, which were paid for from project funds. In September 1986 it was reported to the EEC that fencing of paddocks was 63 percent complete in the pilot wards, but that problems were being experienced in relation to transport for fencing materials and for taking people to cut more timber for fencing posts. The District Administrator had not accounted for the initial EEC payment with the relevant supply invoices, and this was delaying further payments needed for the purchase of materials (Cousins 1988: 34).

By 1990 this problem had not yet been resolved, preventing the completion of fencing in Wards 4 and 23. All the paddocks in Tagarika village in Ward 14 had been completed, but the planned extension of the programme to other villages within the ward was now not possible. In 1986 some fencing had been diverted from the first two Ward 4 villages in the programme (Machingo and Mativenga) to a village, Mangezi, which had joined Machingo in the new VIDCO structure.

From 1985 through to 1990 Agritex staff continued to undertake land use planning exercises in other villages in the district which expressed interest in the programme, but most of these plans remained unimplemented due to the shortage of funds. From around 1987/88, however, the District Administrator's office began to make grants of fencing materials to communities as part of the public works programme, and boundary fencing was erected in villages in other wards within the district. Unfortunately it has proved difficult to locate any documentation of these schemes.

By 1990, however, only Tagarika village in Ward 14, the home of Councillor Sithole, could be said to be a completed and fully functioning scheme. All households in Tagarika were living in a centralised village area, and many had received loans to build

improved houses under the Rural Housing Scheme. The chairman of the VIDCO claimed that Short Duration Grazing was being practised, and that the community had agreed to a rule that households with more than 12 head of cattle should share cattle with stockless households, as in the traditional kuronzera arrangement. The reality of these claims is difficult to establish. In the rest of the district the MRLRP was proving much more difficult to get off the ground, and had lost its high profile and reputation as a grassroots initiative to restructure land use in communal areas.

3.6 MANGEZI GRAZING SCHEME

In the late 1980s Mangezi had a reputation within Mwenezi District for being better organised and more willing to accept the central features of the Mwenezi Radical Land Reform Programme (MRLRP) than most of the other communities within the programme. However, implementation of the grazing scheme resulted in internal conflicts, paddocking was not completed despite the availability of fencing materials, and there was no attempt to practise the recommended SDG grazing system. Institutional development was weak, with few meetings held by the grazing scheme committee and little discussion of by-laws. Livestock owners within Mangezi made use of the paddocks to reduce the time spent herding, and showed commitment only to maintaining boundary fencing which excluded neighbours.

3.6.1 Ecological and technical characteristics

Habitat patches

Land use in Mangezi at the time of research is shown in Figure 11, and the availability of habitat patches for grazing purposes in Table 3.18. Most of the grazing areas within Paddocks 1 and 2 belonged to the mixed deciduous woodland types identified by Vincent and Thomas on granitic sands and loams in Natural Region IV. They have been designated as "sandy loam woodland" in Table 3.18. The quantity and quality of the grazing was generally poor to average, and lacked bulk rather than palatability. Better grazing was found in the drainage lines within these paddocks, which have been separated out as a distinct habitat patch.

Found mostly within Paddock 3 was a zone of red loamy soil of high level alluvium. This habitat patch, together with smaller patches of alluvium close to the Chivakhe River in Paddocks 1 and 2, and in the unfenced grazing area, have been labelled "alluvium woodland" in Table 3.18. The quality of grazing in these zones was generally somewhat better than in the sandy loam woodland, with Urochloa mossambicense ('mbavani') found in abundance and Panicum maximum found in patches under trees.

The narrow riverine zone has been classified as a separate habitat patch. Only half of the home site area, which usually contained at least some crops, was estimated to be available for grazing in the wet season (and some of this area was taken up by cattle and goat kraals). This is also classified as a habitat patch.

Figure 11. Land use in Mangezi grazing scheme

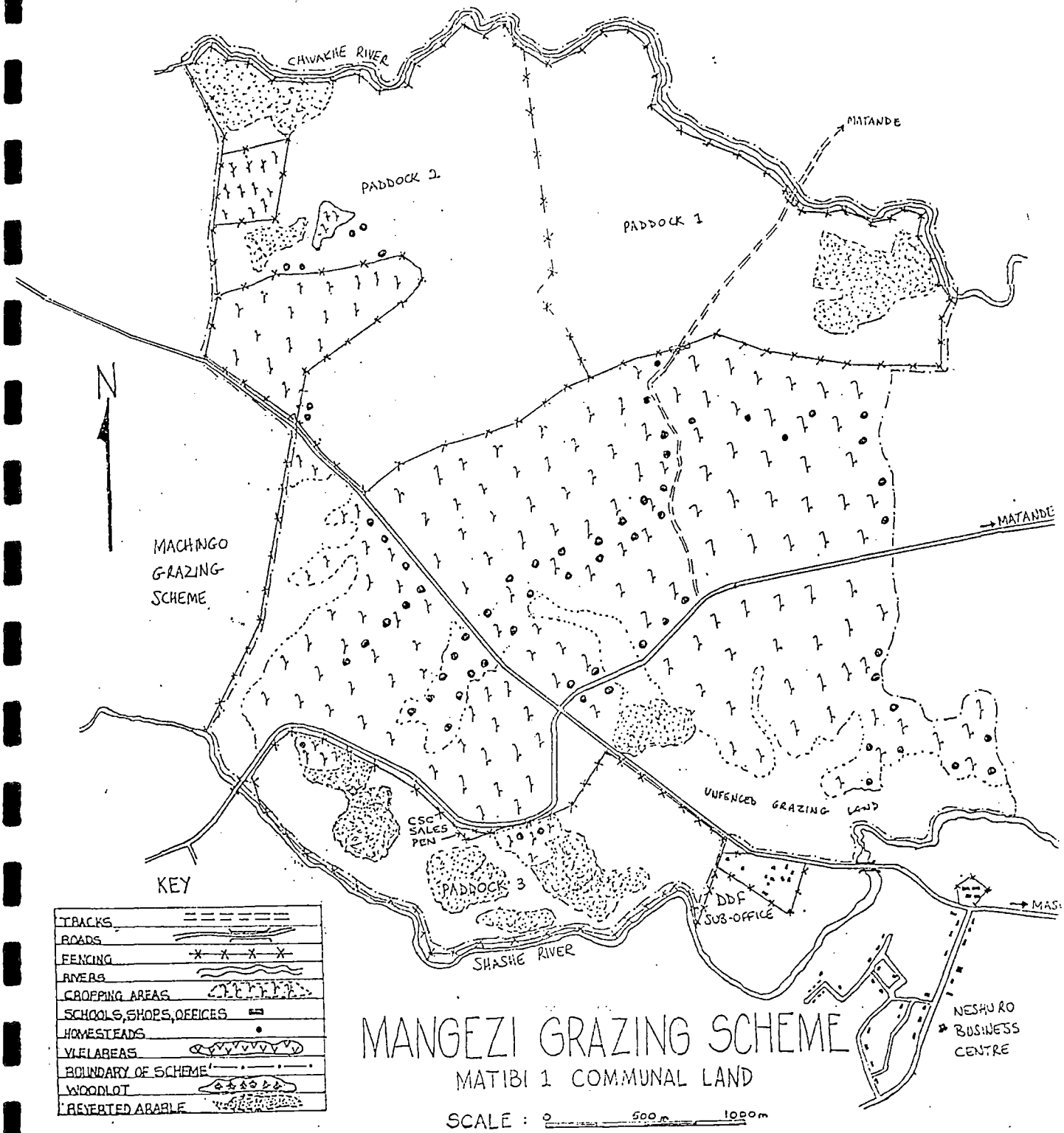


Table 3.18 Habitat patches available for grazing within Mangezi grazing scheme in different seasons

	Wet season (ha)	%	Dry season (ha)	%
Fields	0	0	296.0	37.6
Sandy loam woodland	274.2	57.6	274.2	34.7
Alluvium woodland	154.0	32.3	154.0	19.5
Drainage lines	14.4	3.0	14.4	1.8
Home sites and kraals	17.0	3.6	34.0	4.3
Riverine	16.5	3.5	16.5	2.1
Total	476.1		789.1	

The grazing scheme

Fencing of the scheme, with materials supplied by the District Council from EEC funds granted to the MRLRP, began in May 1986. By September 1987 the perimeter fencing of the three paddocks had been completed, and a beginning made on the internal divisions. By mid-1990 the division between Paddocks 1 and 2 had still not been completed, despite the availability of fencing wire. About 12 families which had been located in the grazing areas moved homesteads and fields to the central areas of settlement in 1986 and 1987, but a few people refused to move: three households in Paddock 3, and four in Paddock 2. The latter used grazing scheme fencing materials to fence off their fields and claimed that they were given official sanction to do so; this was disputed by others within the scheme.

Agritex recommended that the scheme follow a Short Duration Grazing system, using a two week rotation, and committee members faithfully reiterated to visitors that this was the management plan they hoped to follow one day. However, no attempt was made during either the 1988/89 or the 1989/90 cropping seasons to implement this recommendation. Residents in Mangezi put their livestock into either Paddocks 1 and 2, which were not separated by fencing, or into Paddock 3, at any time they wanted to without consulting the committee or anyone else. The decision as to where to place grazing animals appeared to be an individual one. Owners used the paddocks to reduce the time spent herding during the cropping season.

The stocking rate in 1988/89 in Mangezi was 1 LU to 4.7 ha for the total land area, but only 1 LU to 2.7 ha for the non-arable areas (Table 3.2). Since the recommended stocking rate is 1 LU to 8-10 ha, according to conventional estimates Mangezi was severely overstocked. With a mean of 3 head of cattle per household the supply of cattle for draught and other purposes was clearly inadequate.

The high stocking rates led to pressures from extension staff to reduce stock numbers through increased sales to the Cold Storage Commission, but given the already inadequate supply of draught animals it was not surprising that this did not have much effect. To the contrary, Mangezi residents spoke of the need to increase herd sizes, and they hoped the grazing scheme would help them achieve this goal.

One of the ways in which the scheme could do so was by protecting Mangezi grazing from the incursions of livestock belonging to neighbouring villages. Repairs to the perimeter fencing were seen as necessary to achieve effective protection from "poaching" of grazing, as well as to stop unherded animals from straying into fields. Decision making within Mangezi with respect to rangeland revolved around fence maintenance and attempts to resolve disputes with neighbours (i.e. issues of control and access) rather than management.

Exclusion of outsiders was possible in Mangezi given the boundary fence, but the fact that a major access track from neighbouring Matande village to Neshuro Business Centre ran through Paddock 1 (see Figure 11) presented many problems. Gates were often left open by people using the track, with the result that unherded Mangezi livestock wandered out of the paddock and caused damage to crops in the villages of Matande and Mukweva, or that neighbours' cattle entered the grazing scheme. This problem led Mangezi to attempt to fence off the track as an access "corridor" in early 1990, using grazing scheme fencing materials, but Agritex officials refused to sanction this move.

Exclusion of outsiders' livestock from the unfenced grazing area north of the District Development Fund (DDF) sub-office (sometimes referred to as "Paddock 4") was problematic. The location of a diptank nearby meant that large numbers of cattle regularly gathered in this area and grazed on the higher quality grasses found in this alluvium zone. Members of Mangezi sometimes asserted a desire to obtain more fencing from the MRLRP so that another paddock could be constructed here.

Patch use by livestock

The use of habitat patches by cattle was investigated between January and December 1989. A herd containing 8 cattle, whose home kraal was nearly equidistant from Paddocks 2 and 3, was followed. Paddocks 1 and 2, where the sandy loam woodland habitat was concentrated, were extensively used during the cropping season (Table 3.19). However, the preference index (PI) for this habitat patch is negative (less than 1), whereas the PI for the small area of drainage lines within these paddocks is very high (5.57), indicating the importance of these as a key resource (Table 3.20).

The alluvium woodland was used for grazing for only part of the time in the wet season and thus has a negative PI value. In contrast both the home sites and the riverine zone have high positive values. The riverine zone has a high PI value at all

times of the year because it was virtually the only source of water for livestock. The value is highest for the late dry season because the cattle spent a considerable amount of time browsing on palatable tree and shrub species in this zone.

In the early dry season cattle spent nearly half their time grazing on crop residues and grass growing on contour ridges in the fields. Nearly a third of their time was spent in the alluvium woodland zone where they grazed mostly on Urochloa mossambicense. In the late dry season the time that the herd spent in the fields decreased considerably. More time was devoted to grazing and browsing in the alluvium and riverine zones. The small amount of time spent in the sandy loam woodland area in the late dry season was devoted to browsing on the slopes of the hills.

Table 3.19 Seasonal habitat patch use in Mangezi, 1989 (expressed as a percentage of total feeding time)

	Cropping	Early dry	Late dry
Fields	-	47.5	26.5
Sandy loam woodland	43.6	0.0	4.2
Alluvium woodland	16.7	31.3	36.0
Drainage lines	16.7	0.0	0.0
Home sites and kraals	10.0	13.2	14.1
Riverine	13.0	8.0	19.2

0.0 = patch available but not used

Table 3.20 Foraging preference index, Mangezi 1989

	Cropping	Early dry	Late dry
Fields	-	1.26	0.70
Sandy loam woodland	0.76	0.0	0.12
Alluvium woodland	0.52	1.61	1.85
Drainage lines	5.57	0.0	0.0
Home sites and kraals	2.78	3.07	3.30
Riverine	3.71	3.81	9.14

The pattern of habitat patch use by this herd thus appears to reflect a grazing strategy exploiting environmental heterogeneity across space and time. The contrasting character of the sandy loam woodland areas and the alluvium zones was significant, this herd making more use of the former in the wet season and more use of the latter in the dry season.

The major perceived benefits of the grazing scheme in the eyes of Mangezi residents were the reduction in time spent herding made possible by the paddocks and the protection of Mangezi grazing from outsiders' animals. Mention of controlled rotational

grazing through all three paddocks was only ever made by committee members, and this was never discussed at community meetings when the question of the grazing scheme was raised. When the issue was raised in interviews, respondents always stressed individual decision making, as was the notion that members of the community could choose to put animals into any of the three paddocks. This flexible arrangement may reflect an underlying and implicit principle, that of maximising the possibilities for grazing strategies which exploit spatial heterogeneity.

3.6.2 Socio-economic differentiation

In 1988/89 Mangezi was a community with a high proportion (28 percent) of female-headed households (Table 3.3), most of whom were widows. Eleven households, all non cattle-owners, did not plant any crops in 1987/88, and 8 of these said they were landless. Levels of crop production in Mangezi were poor as compared to neighbouring Machingo (Table 3.4). Small grains (millets and sorghum) were more important in the Mwenezi schemes than in the other case study areas, but maize was still the most widely grown grain crop (66 percent of all households in Mangezi grew maize in 1987/88). Only 3 households, however, sold any maize in that year, and maize sales were not associated with cattle ownership.

The most important differences between households in Mangezi, for a wide range of variables (crop production, ownership of other livestock, wealth indicators such as housing, etc) were evident when cattle owners were compared to non-owners. There were fewer statistically significant differences between households at the three levels of cattle ownership than in the other case study schemes. Less than a third of households contained wage workers and the relatively poor access to external income that this entails may have contributed to poor levels of crop production. It is harder to distinguish a layer of wealthier cattle-owning households who also dominated surplus crop production in Mangezi than in the other case study schemes.

3.6.3 Institutional arrangements and power relations

The VIDCO

When VIDCOs were first formed in 1985 Mangezi was placed in Ward 4, and formed one VIDCO (Mavangwi VIDCO) together with its neighbour, Machingo. The kraals had equal representation on the VIDCO, and there were no separate grazing scheme committees; these were meant to be sub-committees of the VIDCO.

Although VIDCO meetings to discuss issues such as drought relief took place, the fact that the two communities had separate grazing schemes tended to undermine the effectiveness of this body. Between 1988 and 1990 there was a discernible decline in VIDCO activity, and a tendency for Mangezi and Machingo to meet separately, often to discuss issues to do with the grazing schemes. At the same time the grazing scheme "sub-committee"

found in Mangezi did not constitute an effective decision-making body either.

"Traditional" leadership

In 1986 the sabhuku for Mangezi died, initiating a factional struggle over succession to this position which had not yet been resolved by mid-1990. Divisions within the ruling lineage meant that in the period of research it was not clear who even the acting sabhuku was. These divisions partly overlapped with opposing viewpoints on the value of the grazing scheme, and on the issue of relocations out of the grazing areas into the central line of settlement.

One of the main contenders for the post of sabhuku had his homestead and fields in the part of Paddock 2 which was designated grazing land, but was instead fenced off with donated grazing scheme materials. The other main contender for the post was an enthusiastic supporter of the paddocks, and often helped the VIDCO chairman organise fence repair sessions. Other members of the ruling family did not consistently support either faction, and their waverings added to the confusion.

The Ward Councillor

The Councillor for Ward 4 from 1982 to 1990 was Francis Christmas. Christmas, whose home was in Machingo, was also Batanai District Council Chairman between 1982 and 1986, and then again from 1988 to 1990. He played a key role in the initiation of the Radical Land Reform Programme, and was responsible for Ward 4 becoming one of the "pilot wards" within the MRLRP. The Councillor continued to enthusiastically promote the programme within the District and was also one of the main architects of the Council's drive to adopt and implement conservation and land use by-laws.

Christmas belonged to the ruling lineage within Machingo kraal, and was involved in a dispute there with one of his relatives who was the sabhuku, and who refused to be relocated out of one of the paddocks. He was also centrally involved in the dispute within Mangezi over the fencing of the fields of the 4 households who refused to move out of Paddock 2. Christmas sanctioned the use of donated fencing materials for this purpose "as a temporary measure", until alternative land and residential sites had been found. The households subsequently claimed that no alternative land of comparable quality or quantity was available, and invoked the Councillor's authority in claiming a right to the use of the fencing.

Although Christmas was recognised as the most capable leader within the Ward, and was praised by many residents of Mangezi and Machingo as "someone who knows development", he had both detractors and supporters within these communities. This was partly because of his involvement in local disputes over relocation, but also because of his eagerness to have Council initiatives (such as by-laws on conservation and land use)

implemented. Christmas claimed, for example, that these by-laws had been "widely discussed" and were adopted by the Council because they had proved "popular" at the local level. However, attempts in 1989 to enforce some of the by-laws (in connection with the use of sleds and the construction of storm drains) succeeded only in generating resentment, non-compliance and in some wards even violent attacks on "conservation police" employed by the Council to impose fines.

Grazing scheme by-laws

Batanai District Council decided to adopt the Communal Land (Model) (Land Use and Conservation) By-laws at a meeting in 1987, and these were officially gazetted in 1989. However, there was no attempt to apply these by-laws in any schemes within the district; according to the Council Chairman this would have to wait "until a later stage when they stand a better chance of being accepted".

Within Mangezi there had been some discussion of grazing scheme by-laws when Agritex staff first planned the scheme in 1985, but residents and committee members put forward conflicting versions of what had been agreed. Mentioned most often were rules making attendance at fence erection sessions compulsory and prohibiting fence cutting, the use of paddocks by outsiders' livestock, and the felling of trees without permission. None of these appeared to be operational between 1988 and 1990.

The issue of by-laws was discussed at a well attended community meeting in March 1989. Low levels of attendance at fence repair sessions had by this time become a major problem, and a large herd owner from Machingo had been making unauthorised use of Paddock 2. A group of four men was appointed to draw up a set of appropriate by-laws to deal with these problems, but by mid-1990 it had not yet met and the initiative appeared to have been abandoned.

A crisis of authority

Some households within Mangezi were clearly more powerful than others in community affairs; these belonged to the ruling lineage and one or two other leading families. They were not all large herd owners or successful crop producers, and some relied mainly on wage income rather than agriculture. The power elite, however, was internally divided, and the grazing scheme was one of the major sources of conflict. The VIDCO chairman, head of one of the leading lineages in Mangezi, had not managed to constitute either himself or the grazing scheme sub-committee as an effective alternative leadership.

The Ward Councillor had played an active role in bringing Mangezi into the MRLRP and was an influential local presence, but his involvement in intra-community disputes did not help to overcome the lack of effective leadership. Complex and cross-cutting lines of conflict and allegiance within Mangezi resulted in a crisis

of authority which hampered the development of an institutional capacity for rangeland management.

3.6.4 Key actors

The most relevant aspects of social identity in Mangezi in terms of community social structure were, firstly, the fact of cattle ownership, which helped form attitudes to the grazing scheme, and secondly, whether or not households belonged to the ruling lineage. This influenced allegiance in the factional struggle over the vacant postion of sabhuku. Another dimension of considerable importance was location within the scheme, insofar as it involved the dispute over the relocation of the four households in the west of the scheme.

With respect to local power structures, the VIDCO chairman played a key role in the affairs of the scheme, as did the two contenders for the post of sabhuku. External power structures also greatly influenced the course of events in Mangezi - most notably in the person of the District Council chairman and local Ward Councillor. The active and interventionist Council, and the ambitious programme it had initiated and adopted as its central "development" thrust, the MRLRP, were influential in shaping perceptions of the scheme within Mangezi. Agritex personnel also played a central role at different times.

3.6.5 Patterns of interaction and struggle

By October 1988 Mangezi's boundary fences were in urgent need of repair. A community meeting attended by representatives of about half of the total of 68 households was held, and it was agreed to work on the fences on Wednesdays each week. Approval from the chief for working on a chisi day was to be sought by the VIDCO chairman. This took three weeks to secure, but work on the fences did not begin until January 1989. The first reasonable rains had fallen in mid-December 1988.

Attendance at work sessions was poor, with between 5 and 12 households generally represented, and the sessions lasted for 3-4 hours at most. The reason given for beginning repair work at this time was that "cattle are passing out of the paddocks". Two work parties were organised, one for Paddocks 1 and 2 and the other for Paddock 3. According to informants people chose a work party "depending on which paddock you use most", and it was argued by the chairman that this arrangement would encourage higher levels of attendance. This proved not to be the case, however, prompting the meeting in March which gave a small group the task (never completed) of drawing up a set of enforceable by-laws.

The following season repair sessions began in November 1989 and attendance was much higher, with 25-30 households regularly sending representatives. This did not reflect higher levels of motivation, but rather the fact that fence repairs in 1989/90 qualified as a drought relief project under the Food-for-Work programme.

Part of the reason for the poor attendance in early 1989 may have been the lack of enthusiasm for their duties displayed by two members of the grazing scheme sub-committee with mupurisa (policing) responsibilities. The previous November these two men had attempted to arrest a stranger they encountered herding cattle in the Mangezi paddocks, and had "beaten" him in the process. Upon taking him to the local police station the mupurisa found themselves being fined for assault while the stranger was freed. Feeling bitter and disillusioned with the lack of real authority their posts as mupurisa appeared to entail, they not only neglected to assist the chairman in his task of encouraging Mangezi residents to attend work sessions, but, according to rumour, actively discouraged their neighbours from attending.

A different example of power at the community level not being recognized by external authorities occurred in February 1990. In this incident, referred to above, cattle from Paddock 1 wandered through a gate left open by neighbours passing through from Mutande to Neshuro and damaged crops belonging to a member of Mukweva village. The owner of the field demanded a beast in compensation. Since this was only one in a series of disputes involving these neighbours, Mangezi residents decided at a large and well attended meeting to fence off both sides of the access road through the paddock using grazing scheme materials.

The local Agritex Extension Worker ordered that the work on this project be stopped two days after it had begun, on the grounds that the resulting sub-division of Paddock 1 would not make sense in terms of Short Duration Grazing, and because "it is not in the plan for the grazing scheme". The Mangezi leeadership then decided to permanently close the access road, arguing that this was the only option left open to them. This was unlikely, however, to put an end to disputes with their neighbours in Mukweva and Mutande, who admitted that there was insufficient available grazing land on their side of the Chivakhe river and who had often grazed their herds on Mangezi land before the fences were erected.

3.6.6 Outcomes

Mangezi grazing scheme developed a "minimum" form of common property on its rangeland which used boundary fencing to exclude non-members. Few components of the MRLRP other than boundary fencing were implemented, and one, the relocation of homesteads and fields to a centralised site, was the occasion for severe internal conflict. No attempt to implement an SDG system was made. The use of habitat patches by cattle appeared to reflect a strategy of exploiting environmental heterogeneity on a seasonal basis, which was thought by local livestock owners to be more appropriate than rotational grazing according to extension recommendations. Household production was still predominantly agro-pastoral in character, the projected move towards commercial livestock production not having been feasible in any respect.

Institutional development was limited, despite active attempts to create a framework within local government structures (District Council, Councillor, WADCO and VIDCO) for such development. Power struggles between competing factions of the "traditional" leadership of the kraal complicated this attempt.

Population densities of both people and livestock remained high and the growing shortage of arable land contributed to the conflicts over relocations. The possibilities for flexible herding strategies over a wider range of habitat patches was limited by these population densities, and shortages of grazing land in neighbouring communities prompted Mangezi residents to use their paddocks to claim exclusive rights to the rangeland within their boundaries. Despite the Council Chairman's persistent attempts to have central government address the question of resettlement (and thus the possiblity of lower population densities), the MRLRP failed to bring about any changes in this underlying condition.

3.7 MACHINGO GRAZING SCHEME

Machingo grazing scheme was one of the first to be implemented under the Mwenezi Radical Land Reform Programme (MRLRP). Discussions with the community first took place in 1982, land use planning was carried out in 1983, and the first fencing was erected in 1985. Yet by 1990 the scheme was still not complete, and rotational grazing had not been implemented. Although Machingo was a small community with many close ties of kinship it had a history of factional disputes and tensions. In the first decade of independence it experienced a long drawn out power struggle between "traditional" leaders and a "modernising" element represented by the Ward Councillor, who was a key figure in the evolution of the MRLRP. Resistance to planned relocations of homesteads and fields was an important factor underlying the power dynamics within the community. Institutional development in Machingo was extremely weak.

3.7.1 Ecological and technical characteristics

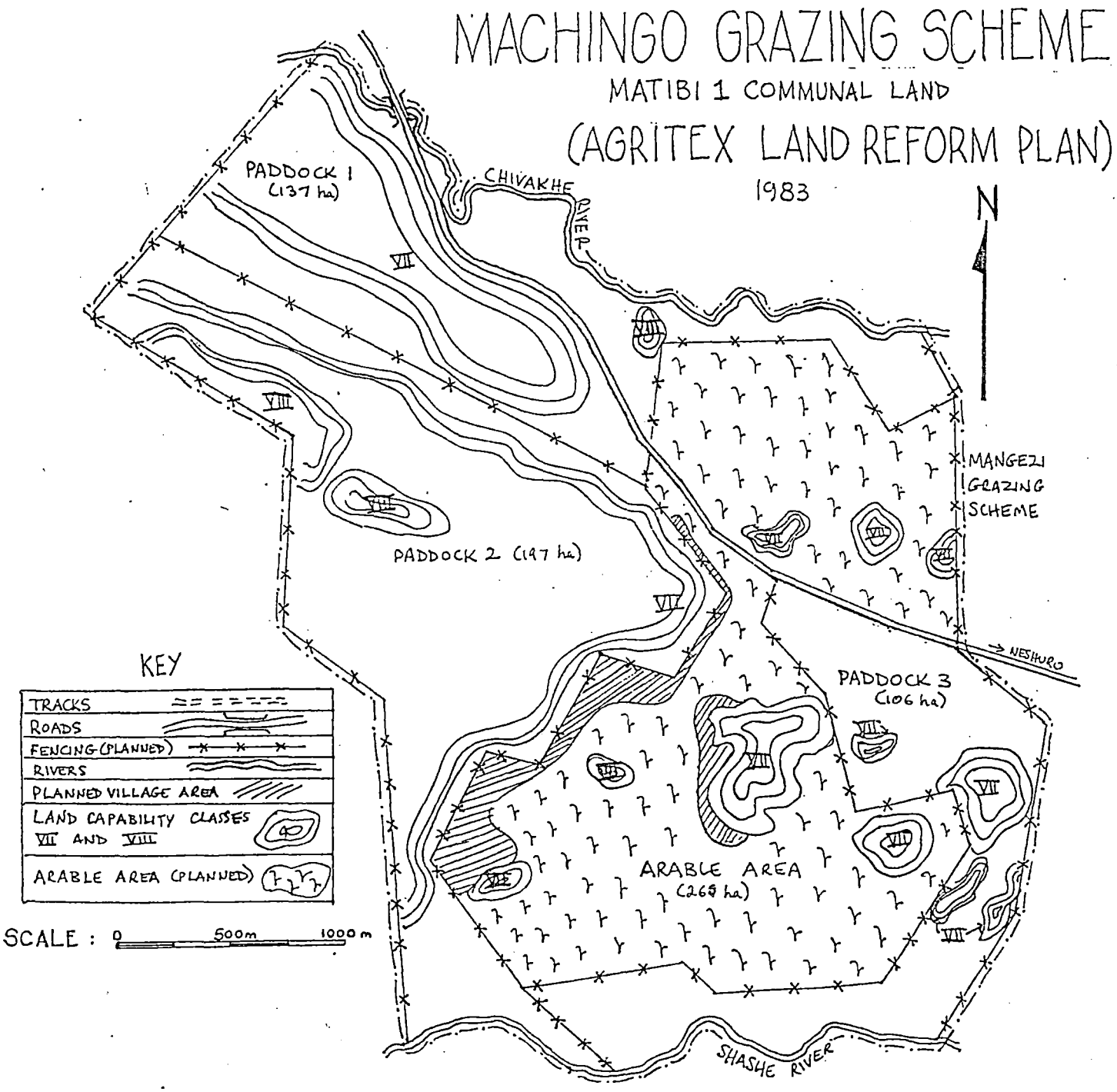
Land use and the grazing scheme

The land use plan for Machingo prepared by Agritex staff in 1983 is shown in Figure 12. The "land reform plan" shows the location of a number of small hills and kopjes within the scheme, classified as land capability classes VII and VIII, and the planned arable block, 265 ha in extent. Three paddocks were planned: Paddock 1 to the north of the scheme and bordering the Chivakhe River (137 ha); Paddock 2 to the west (197 ha); and Paddock 3 to the south and east and bordering the Shashe River (106 ha). Centralised village settlements within the arable land area were also planned, adjacent to two kopjes in a central location.

A detailed assessment of the pattern of land use in 1988/89 and of habitat patch use by livestock within the scheme could not be carried out for various reasons. However, observations of land use made in the course of fieldwork, together with interview data, revealed that only some aspects of this land use plan were implemented between 1985 and 1990. While in many respects the plan conformed to the broad pattern of land use which existed at the time of its formulation, it also proposed some major modifications, few of which were acted on.

The plan attempted to reduce the area under cultivation and expand the available grazing area correspondingly. Thus the area under crops in 1990 included land in the alluvium zone bordering the Chivakhe River which had been planned to be part of Paddock 1. Fields in Paddock 3 near the eastern boundary with Mangezi grazing scheme were also still under cultivation; these included fields belonging to the sabhuku for Machingo. Only a few homesteads had relocated to the planned village area, and again the sabhuku was one of those who refused to move.

Figure 12. Land use in Machingo grazing scheme



Only the fencing of Paddock 3 had been completed by 1990, and insufficient materials were left over for the rest of the scheme. It was claimed that some of the original fencing materials from the EEC grant had been diverted to Mangezi when it joined the programme in 1986. The boundary fence had been in constant need of repair and this had made demands on fencing materials and labour. More materials had been promised by the MRLRP, but none had been delivered by mid-1990 due to the difficulties experienced by the District Administrator's office in accounting for the first instalment of funds (see section 3.5.3 above).

Machingo was involved in two boundary disputes when the scheme's external fencing was first erected in 1985/6. An argument over the correct location of the western boundary line dividing Machingo's grazing land from that belonging to Zvirikure village was still unresolved by 1990 and incursions of livestock belonging to these neighbours were said to be common whenever the fence was in a poor state of repair. A boundary dispute with Mukweva village to the north of the Chivakhe River was resolved in 1988 when the boundary fence was relocated to the Machingo side of the river. In the period 1988 to 1990 the scheme leadership portrayed the problem of "poaching" of grazing by neighbours as one of the major problems facing the scheme, and attempted to maintain the boundary fencing in good repair through the organisation of work parties.

Attendance at these work parties, however, was poor. Some Machingo residents appeared to have felt responsible for the maintenance of only those sections of paddock fencing separating their own fields from nearby grazing areas. Their decision to undertake this work was taken on an entirely individual basis, and was not seen as a contribution to the community project. In some places (eg. along the southern boundary in Paddock 3) only one strand of wire had been used for the boundary fence while four strands were used for internal fencing (ie. between the paddock and the arable area). This pattern was not consistent, however; in other locations the internal fencing was not well maintained either. In one place the internal fencing had been laid flat because it crossed a pathway much used for the collection of firewood and the gateway to the paddock was about 1km distant.

Two boreholes to supply households with water were sunk under the MRLRP but both contained brackish water, and some residents expressed disillusionment with the programme as a whole.

Habitat patch use

The general features of the environment in Machingo are outlined in section 3.5.1 above. Without detailed data only an impressionistic analysis of habitat patch use by livestock can be made; observations and interviews indicate a similar pattern to that found in neighbouring Mangezi. The contrast between the vegetation in the sandy loam woodland zone and in the high level alluvium zone was again evident, as were the seasonal variations in foraging patterns (heavy utilisation of grazing areas in the

cropping season, of arable fields in the early dry season, and of browse on hillsides and in the riverine zone in the late dry season). The most valued grass species was the palatable Urochloa mossambicense ('mbavani'), and occasional stands of Panicum maximum were found.

Drainage lines carried heavier stands of grass, and where these were found within the arable block they were utilised by herded livestock even during the cropping season. The explanation given by the scheme leadership for the poor state of fencing in one location was its proximity to a drainage line with a particularly good stand of 'mbavani' grass; according to them children on herding duty regularly pulled down the fence to provide access to this drainage line grazing.

In Machingo decision making on rangeland utilisation was highly individualised - perhaps even more so than in Mangezi. Paddocks were used by some households to relieve the labour of herding, making use of those fenced areas closest to their homesteads, but where fences were not well maintained herding continued to be necessary. Livestock from homesteads located in the north eastern corner of the scheme occasionally made use of paddocks in Mangezi, claiming that their contribution to maintenance of the joint boundary fence entitled them to do so (this was disputed by Mangezi residents). No reference was made, in this case or in the other examples of individual decision making, to any institutional context in which these matters were discussed. No rotational grazing involving the community herd as a whole had been undertaken by 1990.

In general very little in the way of collective management of rangeland was attempted in Machingo. As in Mangezi, this may indicate a need to allow individual herders a great deal of flexibility in their use of a spatially heterogeneous environment. However, another possibility to be considered is that the weakness of the institutions supposedly managing Machingo's common property resources may itself have contributed to this individualisation of decision making. Reinforcing this view is the fact that even the maintenance of what fencing had been erected, for purposes of excluding neighbours' cattle, reducing herding or protecting crops from animal damage, proved beyond the capacities of the community.

3.7.2 Socio-economic differentiation

In the period of the research study Machingo was significantly different to its neighbour, Mangezi, in respect of two key demographic variables: only 10 percent of households were female headed (compared to 28 percent in Mangezi), and 60 percent of households contained at least one wage worker (compared to 31 percent in Mangezi - see Table 3.3). This meant that a higher proportion of households in Machingo had access to wage income, but that more male labour was absent from the community for much of the year.

It is likely that some of this off-farm income was invested in agriculture; this helps to explain the much higher levels of crop production in Machingo than in Mangezi. Both mean and median levels of total grain production were over twice as much in Mangezi, and mean maize sales were nearly three times as much (Table 3.4). Large differences between mean and median, however, indicate that these levels of crop production were unevenly distributed.

Machingo contained the highest proportion of non cattle-owners of all the case study schemes (54 percent), and nearly 60 percent of all cattle were concentrated in the hands of the 14 percent of households with herds of 10 or more. Cattle ownership and crop production were moderately strongly associated (Table 3.21), and as in Mangezi the most significant differences in socio-economic status were between non-owners and owners. As the data on sources of draught power indicate, however, there was a high degree of interdependence between owners and non-owners; in Machingo close to 40 percent of households borrowed draught animals from relatives or neighbours (Table 3.7).

Table 3.21 Maize hectarage, maize sales and cattle ownership in Machingo 1987/88

	Cattle ownership			
	0 cattle (n=27)	1-9 cattle (n=16)	10 or > cattle (n=7)	ETA
Hectares under maize (mean)	0.8	1.3	1.3	0.39
Maize sales in bags (mean)	1.0	2.3	7.3	0.37

3.7.3 Institutional arrangements and power relations

The VIDCO

Mangezi and Machingo together comprised Mavangwi VIDCO, which in 1985 had replaced the "Village Standing Committee" which had overseen the introduction of the MRLRP to Machingo. Although a "grazing scheme sub-committee" was formed in Mangezi, in Machingo no such body had come into being by 1990.

When this issue was discussed with Machingo residents in 1987 they were at a loss to explain why no sub-committee had been formed, and indicated that they viewed the VIDCO as the only institution with responsibility for managing the scheme. The absence of some committee members who were wage workers was put forward as a reason for the organisational problems the scheme was experiencing.

By 1989, however, it was apparent that residents had little confidence in the VIDCO, and saw Mangezi as an entirely separate community with its own institutional arrangements for managing common property. The VIDCO Chairman, a Mangezi resident, began to complain that members of Machingo were not co-operating with him and "made their own decisions". When the Food-for-Work drought relief programme began in early 1990, the projects submitted had been decided upon at separate meetings of Machingo and Mangezi, although the programme was supposed to be administered by the VIDCO. The VIDCO declined in effectiveness over time and appeared to gradually lose any potential to play an active role in respect of grazing management.

The Ward Councillor

Francis Christmas, Councillor for Ward 4 and District Council Chairman, played a key role in the initiation of the MRLRP, and it is ironic that institutional development within his own home community was so weak. Within Machingo Christmas was respected for his power and influence at district level, but he had also become embroiled in village-level conflicts. One of these was a dispute with the sabhuku of Machingo, who had refused to move out of the designated grazing areas. According to Christmas the sabhuku was "more than conservative", and his opposition to the land reform plan had been an obstacle in attempts to form a grazing scheme committee.

During the period of research the Councillor worked at an NGO-funded district training centre in nearby Neshuro, where the Batanai District Council offices were located. When not at work he devoted most of his time to Ward and Council business rather than Machingo affairs, rarely attended community meetings except in his official capacity, and sent his son as his representative to fence erection or repair sessions. Nevertheless, his presence within the community was strongly felt. Some residents felt that no village-level leadership had developed in Machingo because there was a general expectation that Christmas would represent community interests in the wider world.

The power and authority wielded by the Councillor generated profound disagreements within Machingo. On the one hand he was seen by some residents as a popular representative of his constituency, taking up issues and representing the interests of residents of his village, the ward and the district; on the other he was perceived by some people as primarily representing external authority - in this case the District Council, part of the structure of local government. The divided response of Machingo residents to the land reform plan reflects these disagreements: Christmas was seen by his supporters as bringing development resources to the community, but by his detractors as encouraging the re-imposition of coercive state power over the lives of rural communities, often in the service of ill-conceived by-laws regulating resource use (see section 3.6.3).

"Traditional leadership"

The sabhuku for Machingo in the period under review was Bian Mahlauri, who had occupied the post for many years and was the undisputed "traditional leader" of the community. Informants claimed that in Mwenezi District generally both chiefs and masabhuku had suffered a severe loss of legitimacy during the liberation war, when they were seen as "agents of the Smith regime", but that soon after independence they began to be again recognised by residents as legitimate land authorities. They shared land allocation powers with the VIDCO and the Councillor, and were consulted whenever boundary disputes occurred. Although the sabhuku had not played any role in grazing scheme development, the position in Machingo was one of "dual authority" over land. The Councillor himself agreed with this analysis, but suggested that a lack of clarity as to the powers and roles of different parties had created the potential for a great deal of conflict. An example of such conflict, he said, was the dispute over relocations out of grazing areas in Machingo.

In March 1989 it was rumoured that the sabhuku had been issued with a "ticket" (ie. asked to pay a fine) by the Council's "conservation police" for not moving out of the grazing areas as stipulated in the land use plan. Bian himself denied this, and said that the local Extension Worker had given him permission to remain within the paddock because of the lack of suitable alternative sites. In any case, he said, "why should I move out of the grazing area when the Councillor himself, (who brings all the by-laws), and many others, are still in the paddocks?"

It was difficult to verify the truth of the sabhuku's allegation since the Councillor's fields lay on the western edge of the arable block adjoining Paddock 1, which had not been fenced and where the precise location of the paddock boundary was not clear. The Extension Worker denied giving permission for anyone to remain in the grazing areas, and explained the divisions within Machingo and the resultant lack of progress as due to two factors: opposition on the part of many to the proposed relocation of fields and homesteads, and family loyalty to the sabhuku.

In March 1989 Bian appointed an acting sabhuku, on the grounds that since he was away working and only returned once a month he could not carry out his duties properly. The appointee was Albert Dzingai, an elder brother of the Councillor, who was said to be only fourth in line to inherit the post but the only one of those in the line of succession locally resident (ie. not away in wage employment)[13]. According to the sabhuku, Dzingai, a firm

[13] A system of collateral succession means that inheritance of authority is not from father to son but from each man to the next most senior within the family. Descent from different wives of the founding patriarch leads to the emergence of "houses", which in theory are supposed to alternate the ruling post, but in practice competition and complex disputes are common

supporter of Christmas and land reform, would be responsible for organising fence repair sessions from now on.

Dzingai responded with enthusiasm to his new responsibilities and made a concerted effort to increase levels of attendance at fence repair sessions. By February 1990 he was talking of having decided to "develop my kraal without any member of the VIDCO because they do nothing for development". Attendance at work sessions continued to be poor, (although it improved when these became an official Food-for-Work project in 1990), and some resentment at Dzingai's "harsh" approach was expressed within Machingo. Bian's decision to appoint the acting sabhuku may have been calculated to encourage further resistance within Machingo to the land reform plan, and to relieve some of the pressure on the sabhuku himself to relocate out of the grazing area.

Party organisation

As mentioned in section 3.5.2 local organs of the ruling party played an important role in the initiation of the MRLRP. Although there is little evidence this was the case in Mangezi, in Machingo local party officials were active in the affairs of the scheme. In the absence of a grazing scheme committee, and given the lack of an active VIDCO, the responsibility for organising work sessions in Machingo in 1988/89 fell on the shoulders of the chairmen of the two party cells (the lowest level of party organisation) within Machingo. These two men, referred to locally as "village chairmen", were both supporters of the Councillor, and regularly led fence repair sessions both before and after Dzingai's appointment. One owned no cattle and the other five, illustrating the point that support for the opposing factions in Machingo did not coincide with levels of cattle ownership or other wealth criteria.

Grazing scheme by-laws

By mid-1990 no by-laws for the grazing scheme had been agreed in Machingo, although respondents indicated that the question of what rules should govern the scheme had been debated in the past - probably in the early stages of planning, when Agritex staff were promoting grazing management. Rules which had been discussed included compulsory rotations, fines for fence cutting, tree cutting and "poaching" by outsider's cattle, and restrictions on the number of cattle held per household.

3.7.4 Key actors

As in Mangezi, cattle ownership in Machingo was a critical dimension of community socio-economic structure influencing attitudes to grazing management. The high proportion of non-owners help to account for the low levels of commitment to completion and maintenance of the scheme.

(Bourdillon 1982).

The VIDCO was potentially a key actor, but failed to exert much influence and declined in importance in the period under review. More important were the Ward Councillor, whose home was in Machingo, the sabhuku (who opposed the scheme), and the acting sabhuku appointed in 1989. The "village chairmen" played a fairly active part in scheme affairs. External agencies which influenced events in Machingo included the District Council and Agritex.

3.7.5 Patterns of interaction and struggle

Council initiatives on land allocation and land use

In October and November 1988 the Batanai District Council initiated a series of discussions and meetings at district, ward and village level on issues related to land. The Council Chairman, Christmas, who had attending a Ministry of Local Government workshop in Harare in August which had raised some of these same issues, played a leading role in these discussions. The issues raised were:

(a) the high population densities within the district, the difficulties this created for agricultural development, and the consequent need for increased resettlement

(b) the minimum land allocation required by individual households, together with desirable herd sizes, and the possibility of equalising land allocations

(c) the land rights of those without land at present, and whether or not households whose heads were in permanent employment should be allowed to retain their fields

(d) the enforcement of Conservation By-laws, and the imposition of fines on those households still occupying sites in designated grazing areas.

Part of the rationale for the meetings held to discuss these issues, according to Christmas, was to collect data on the "surplus" population in the district, so that figures could be sent to central government. This would put pressure on policy makers to expand the rate of resettlement, without which the MRLRP could not succeed.

The meetings, however, generated dissent and confusion. The Council Chairman introduced into the discussions the notion of a minimum land allocation of 4 ha and a minimum herd size of 20 cattle per household. At many meetings residents pointed out that, given present population densities, there was insufficient land for such generous "minimum allocations". They also expressed scepticism at the suggestion that government was preparing to mount a massive resettlement exercise, and opposition from some to ideas of "equalising" land holdings or asking households with large holdings to share land with the landless, particularly if they were not relatives. Open resentment was expressed of the announcement that fines would be imposed in terms of Conservation By-laws on those households using sleds to transport ploughs to

fields, or ploughing without first constructing a storm drain above the fields.

At one well attended meeting held in Mavangwi VIDCO the Councillor announced that people still living in the grazing areas would be arrested, but it was angrily pointed out to him that many of his neighbours and relatives in Machingo were occupying sites in the paddocks. "You can start arresting people in your own area" said one person. When Christmas replied that this was a resolution of Council, someone responded; "But we send you to the Council...", and another said: "You asked us to make paddocks and to resettle, now you are getting people to come and arrest us!".

Over the next few months these initiatives came to nothing; there was no sign of any change in official policy in respect of land allocations or resettlement planning, and the attempt to enforce Conservation By-laws generated such intense resentment that it was quietly dropped. Scepticism of the rhetoric of the MRLRP grew, augmented by the continuing failure of the Council to secure the promised additional fencing materials or improved water supplies for those communities which had joined the programme. Within Machingo the possibility of the powerful and externally well-connected Councillor becoming an aid to internal institutional development receded.

Fence repairs in Machingo

In mid-November 1988 a meeting was held in Machingo to arrange for repairs of the grazing scheme fences. The Councillor was in attendance but the meeting was chaired by one of the local party chairmen. It was agreed that work sessions would take place from 6 a.m. on Wednesdays each week, that one person from each household would attend, and that women would dig holes for posts while men would cut fencing posts and strain wire. It was decided at first that a fine of a hen would be paid by absentees, to provide food for those who did attend, but after no-one would volunteer to collect the fines the idea was dropped.

In early December the first repair session was held, with the two "village chairmen" in charge, but only 18 people in attendance. Beer drinks and the lack of sanctions for absenteeism were blamed for the poor turnout. The following week the work session was cancelled because it clashed with a ward conservation meeting, and the week after only 11 people attended for a session lasting only two hours. Again intense dissatisfaction was expressed with the lack of action against absentees, some people threatened not to attend unless action was taken, and the opinion was voiced that many people were only prepared to work on those sections of paddock fencing which were nearby their homes. It was suggested that work sessions should perhaps be organised in terms of the village sections corresponding to the party cells.

Attendance continued to decline in January and February 1989, sometimes falling as low as 5 or 6 people, and often no sessions were held at all. Repairs were mainly carried out on boundary

fencing, and twice the reason given for this was that reports had been received of neighbours' cattle grazing in Paddock 2. By March many sections of the paddock fences were still in a poor state of repair.

In late March 1989 the newly appointed acting sabhuku, Dzingai, called a meeting in Machingo to discuss the problem of poor attendance. The meeting was well attended and the Councillor and the VIDCO chairman were also present. There was a great deal of acrimony, and accusations and counter-accusations were traded back and forth. Dzingai named a number of people whose homes were close by to sections of fencing in particularly poor states of repair and held them responsible for this, but some of those present blamed the problem of low levels of commitment on poor community leadership. The problem of fence cutting by neighbours and "poaching" of Machingo grazing by outsiders' cattle was put forward as a major problem, and one man said that "paddocks are no use if cattle from Mativenga graze in our paddocks but ours do not go to their area".

The question of by-laws was discussed, and four "fence repair leaders" (which included the two village chairmen) were elected and charged with the task of convening smaller meetings to develop appropriate rules and regulations. The Councillor supported a suggestion that attendance registers be kept, and announced that he would ensure that only those who attended fence repair sessions would in future be eligible for the Food-for-Work programme.

Despite these decisions there was little improvement in levels of commitment to fence maintenance in Machingo. No further repair sessions were held that year and no by-laws were forthcoming from the "fence repair leaders". In January 1990 work sessions began again, as a public works project in terms of the Food-for-Work programme, with gully reclamation as a second project. Levels of attendance were now much higher. Dzingai and the village chairmen were the chief organisers of this programme, and the boundary fences to the north and west were completely repaired by April 1990, when the programme came to a halt due to inadequate supplies of maize by government.

3.7.6 Outcomes

By mid-1990 it was clear that the divided community of Machingo was unlikely to complete the fencing of paddocks and the relocation of homes and fields out of designated grazing areas, and begin to implement recommendations for rotational grazing. Internal power struggles were centred mainly around a widespread resistance to relocations, but were also articulated in terms of an opposition between "traditional" and "development-oriented" leaderships. Inequalities in respect of cattle ownership, crop production and wage income appeared to not be relevant factors in these internal divisions.

To what extent was the failure of the grazing scheme a result of the paralysing effect of these power struggles on local

institutional development? Alternatively, was opposition to the scheme rooted in a perception that it was an ecologically inappropriate plan which failed to address the heterogeneity of rangeland resources? The latter view had not been articulated by any of the group who refused to relocate out of grazing areas and who generally failed to attend fence repair sessions. They emphasised instead the difficulty of finding suitable alternative sites in the planned centralised village area and arable block.

On balance the failure of Machingo to organise collectively to maintain even the most basic condition of their minimum common property regime (exclusion of outsiders) can be understood in terms of two underlying factors. Firstly, the bitter struggle between the two opposing community factions, together with the ambiguous position of the most powerful community leader, Christmas, created a power dynamic which tended to undermine the emergence of an effective and united leadership committed to common property management. Secondly, the spatial distribution of arable land in Machingo meant that planned relocations affected many households (more than in neighbouring Mangezi, for example) and a general shortage of arable land left little room for flexible readjustments. The power struggle was closely related to, and perhaps had its origin in, the tensions generated by this perceived threat to people's livelihood.

4. LESSONS FOR RANGELAND MANAGEMENT POLICY

What lessons can be drawn from the responses of the five case study communities to grazing scheme policies? In section 1.5 grazing scheme policies in Zimbabwe were evaluated on the basis of survey findings and the broad generalisations of different authors. Returning to these assessments in the light of the case studies is a useful place to begin to look for lessons for policy.

4.1 Re-assessing grazing scheme policies

Reasons for adoption

The case studies reveal a range of motivational factors underlying the decision to adopt a grazing scheme. In Chamatamba, for example, the motives of the elite leadership group were very different from the motives of ordinary members. The leadership was intent on engaging in capital accumulation activities such as pen fattening of cattle, and were using the grazing scheme as a means for securing government and donor support for these, while for other herd owners paddocks were seen as useful for reducing herding labour in the cropping season, protecting crops, and keeping the use of grazing land exclusive to the group of co-owners within the commnity as a whole.

In Mutakwa the scheme leadership was drawn from cattle owners closest to the fenced paddocks who used them primarily to reduce herding labour, and this was the major perceived advantage of the paddocks. Members of the community located some distance away were much less committed to the scheme. The fences also excluded neighbours' cattle from a portion of the valuable vlei grazing. In both Mutakwa and Chamatamba an additional motive for continuing to present the grazing scheme in a positive light was the expectation of further donor or government support for other kinds of development projects.

In Maraire no fencing had been erected and range management consisted of deferring grazing on a portion of vlei grazing until the early dry season. Exclusion of non-members' livestock was the major problem, and fencing was desired to make this possible in relation to all of Maraire's relatively favourable endowment of grazing land.

In Mangezi the major motivational factor was again the possibility of exclusion of outsider's livestock, reductions in herding labour and crop protection. An additional factor may have been expectations of improved water supplies and other infrastructure promised by the Mwenezi Radical Land Reform Programme (MRLRP). The scheme was not popular with people expected to relocate out of designated grazing areas, and conflict engendered by relocations undermined the completion of the scheme in neighbouring Machingo.

In none of these schemes was the opposition of non-cattle owners a problem. Nevertheless internal conflict made implementation

difficult in most cases, usually because of the uneven spread of costs and benefits across the community. Location relative to paddocks was the critical factor here. Boundary disputes with neighbours tended to reinforce community identity rather than undermine it.

Significantly, a detailed study of what people did rather than what they said to outsiders and visitors, revealed that in these schemes the possibility of improved range management and productivity was not a major motivational factor influencing adoption. The partial exception was Chamatamba, where the wealthy minority interested in commercial livestock production showed interest in the development of improved pastures. The continuing support for the deferred grazing system in the two Zimuto schemes, however, shows that there is a definite potential for innovations aimed at improving range management provided they are perceived as ecologically appropriate by communities.

Stock reduction and control of numbers

The case studies confirm the finding that grazing schemes have had little impact on stocking rates, and that if anything adopting communities expect to increase their herds rather than reduce them. Members of these schemes acknowledged the existence of upper limits to stocking rates, when numbers would have to be controlled, but felt that these had yet to be reached.

The provision of draught power was clearly one of the most important functions of cattle for households in these communities, and only the leadership elite in Chamatamba showed any interest in commercial beef production. Offtake rates in the schemes remained low, and the policy of promoting destocking through encouraging herdowners to sell unproductive animals did not meet with any success.

Large proportions of all these communities relied on other households (usually relatives) for the supply of draught animals. The possibility of more formal arrangements for pooling draught resources, and thus reducing the urgency of the need to acquire more animals, was not explored in any of these schemes. This was an explicit goal of the MRLRP but had not been promoted in either Machingo or Mangezi.

Implementation of grazing management recommendations

None of the five case study schemes were found to be practising the recommended Short Duration Grazing (SDG) system, despite claims by some of them that this was the case. In Chamatamba the "winter reserve" system which had been inherited from the pre-independence period was only partially in operation. A form of deferred grazing was in operation in the two Zimuto schemes, making use of productive patches of vlei grazing. In the case of Mutakwa this took place outside of the fenced paddocks, and the formal grazing scheme appeared to be frustrating rather than facilitating effective management of scarce rangeland resources.

In Mangezi and Machingo herding decisions were left to individuals and no form of common rotation was practised.

Analysis of the use of different habitat patches by cattle in three of the schemes showed that heterogeneity of forage resources was important over both space and time. Some patches were much more intensively used than others, and the pattern of use varied significantly by season. Common to all the schemes was the importance of crop residues and contour bank grazing in the early dry season, and riverine zones in the late dry season.

Habitat patches varied between different agro-ecological zones. In Chamatamba some of the most significant variations were at the micro-scale, with termite mounds providing higher quality grazing than the surrounding grassland. In the Zimuto schemes there was a marked contrast between the unproductive toplands, which comprise the largest portion of the grazing areas, and the smaller but more productive vleis. The two Mwenezi schemes enclosed grazing areas with different soil and vegetation types and herding strategies appeared to exploit this heterogeneity.

The design of the fenced grazing schemes by Agritex planners all followed a standardised format based on SDG principles (paddocks of roughly equal sizes on large blocks of grazing land, clearly separated from arable and residential sites, and aimed at allowing grazing periods of 10 days to 2 weeks per paddock). The designs took little or no account of existing herding practices or deferred grazing systems, and extension recommendations made no reference to the "patchiness" of grazing resources or possibilities for improving the effectiveness of their use. There was a sharp contrast between the current practices of herders and foraging preferences of livestock, on the one hand, and the standardised recommendations of extension staff, on the other. A disjunction between these recommendations and the localised ecological knowledge of stock herders was probably the major reason for the failure of schemes to implement the recommended management practices.

Improvements in range condition and animal production

Criteria used in assessments of range condition derive from some theoretical framework or paradigm, and the technique developed in Zimbabwe by Ivy (1969) clearly has its basis in the "mainstream approach" (Behnke and Scoones 1991) outlined in section 2 above. The applicability of this approach to arid and semi-arid communal grazing situations has been called into question, but an alternative method has not yet evolved. Given these uncertainties it is difficult to make unequivocal judgements on range condition in Communal Land grazing schemes.

Maclaurin visited the case study schemes in May and June of 1989 and used the conventional methods to assess range condition. His findings and comments are presented here.

Table 4.1 Range condition assessments in case study schemes, (May/June 1989)

Method used: Ivy (1969)

	Mar (Pad 1)	Mar (Pad 2)	Mut (Pad 5)	Mut (Pad 4)	Mang (Pad 3)	Cham (summer gr)
Species composition	6	4	3	5	6	6
Basal cover	5 (4%)	4 (4%)	1 (1-4%)	3 (0-5%)	2 (1-2%)	4 (4-5%)
Litter cover	1	2	1	3	3	4
Erosion and compaction	5	6	5	6	6	4
Forage vigour and production	4	5	2	3	7	6
Veld score	21	21	12	20	24	24
Veld rating	Fair	Poor to fair	Poor	Poor to fair	Fair	Fair

Comments:

Maraire, Paddock 1 (Mukengi vlei): Species composition variable, depending on position of observation it would appear to contain some reverted and disturbed land. Basal cover quite high, but patchy and due in part to Cynodon (couch) cover. Litter almost non-existent. Obvious pedestals and a worrying erosion channel in the main water course. Considering the rest from grazing, vigour is only fair at this time, but plants have obviously seeded or are seeding.

Maraire, Paddock 2: Somewhat similar to Paddock 1, but with less high succession grasses and rather patchy cover in part due to disturbance. Vigour and production similar.

Mutakwa, Paddock 5: Dearth of grass cover under the miombo trees, but some good grasses in the open vlei area. Patchy and poor grass cover. Surface erosion fair but obvious. Vigour poor except in the vlei.

Mutakwa, Paddock 4: Rather better cover and composition of grasses than in Paddock 5, but still poor under the miombo trees. Plants appear to be slightly more vigorous. Evidence of seeding but this may be due to lighter use.

Mangezi, Paddock 3; Species composition quite good. Obviously reverted land, still with signs of disturbance. Recent rains have improved late season production. Obvious pedestal and sheet erosion, especially on unprotected slopes, typical of red soils.

Chamatamba, summer grazing area: Fairly variable veld, influenced by a shallow water table. Cover slightly variable, only fair for conditions but some litter present. Quite severe pedestalling in places and soil surface movement, compensated by the flatness of the landscape. Vigour quite good, but appears underutilised.
(Maclaurin pers. comm.)

It is clear from this assessment that in terms of mainstream criteria these grazing schemes have not showed great improvements in range condition. Since rotational grazing through the paddocks has not been practised this evidence says nothing about the merits of rotational versus continuous grazing. If any "improvements" had been noted they could well have been due to reduced stocking rates as a result of the exclusion of outsiders.

However, it is notable that only one paddock, in Mutakwa, was rated as being in poor condition, despite high stocking rates. In the early 1970s pasture scientists were surprised at how much better than expected was range condition in the grazing schemes studied by Danckwerts (nd.: 58), and perhaps these kinds of observations reflect the "resilience" of rangeland under high stocking rates (Abel and Blaikie 1989).

Institutional capacity for common property management

Only one scheme, Chamatamba, displayed high levels of organisational capacity, but these were put to the service of the private accumulation strategies of the leadership rather than to the task of developing a capacity for management of the commons. In Mutakwa, Maraire and Mangezi the elected grazing scheme committees met seldom, called few community meetings, and were easily discouraged by internal conflicts. Institutional development was exceedingly poor in Machingo. Maintenance of fencing was problematic in all schemes because regular attendance at repair sessions by a majority of members proved difficult to organise. Only the Chamatamba committee kept an adequate set of written records.

Although the committees in these schemes claimed that by-laws had been discussed and agreed on at community meetings, knowledge of their contents amongst both committee and community members was extremely sketchy. Very few instances of by-laws being enforced were observed, and these had mostly to do with the exclusion of outsiders; one notable exception was the disciplining of herders not observing the deferment rule in Maraire. In Mutakwa by-laws drawn up by Agritex and agreed to by the leadership as a condition of donor funding played no part in the operation of the scheme. The Communal Land (Model) (Land Use and Conservation) By-laws adopted in 1987 by the Batanai District Council in Mwenezi

had not yet been brought into operation in any schemes within the MRLRP.

In only two schemes, Mangezi and Machingo, was the VIDCO a potentially useful institutional setting for common property management. However, this potential declined over time as the two schemes, supposedly closely linked within the same VIDCO, increasingly separated their affairs from each other. The fact that in none of the case studies did VIDCO boundaries coincide with those of the scheme contributed to the increasing irrelevance of the formal structure of local government institutions. However, the institutions more firmly rooted in local communities (the elected committees) had not yet developed a great capacity for common property management either.

Although paddocks in the case study schemes were not used for rotational grazing, some members of the schemes were clearly committed to maintaining the boundary fences. Exclusion of neigbours' livestock was an important reason for these communities adopting the grazing schemes. The fenced paddocks in Mutakwa, Mangezi and Machingo, and the first lines of fencing erected in Chamatamba, were thus all used to maintain a "minimum" version of common property. In the two Zimuto schemes the deferred grazing system which was operated on productive vlei grazing areas meant that in these cases rangeland was more actively "managed". They thus involved a more developed version of common property. It is interesting that these regimes were relatively effective even in the absence of fencing, although exclusion of non-members when rested grazing was opened up for use was problematic.

To what extent was the weakness of institutional development in these cases due to the design of the grazing schemes, which failed to take note of how livestock in the Communal Lands use the spatially heterogeneous rangeland resources available to them? In Mutakwa the disjunction between the fenced paddocks and the preferred strategy of deferring grazing on Musari vlei certainly contributed to internal conflicts and a decline in support for the grazing scheme committee. In other schemes the connection was less direct, but it was clear that a "package" approach to grazing scheme planning and implementation on the part of extension staff had led to a neglect of the particularities of local situations.

Extension staff tended to focus their efforts on the technical rather than the institutional dimensions of grazing schemes. Combined with a generalised neglect by government departments of any form of local institutional development, this meant an absence of effective external support for grazing scheme committees.

Summary

The case studies presented here, although few in number, confirm the generalised conclusions made in section 1.5 above. Grazing scheme policies in Zimbabwe have seen few successes in terms of

the objective of encouraging the emergence of effective common property management regimes. Communities have responded to these policies in a variable and highly selective manner. Adoption of the recommended technology (rotational grazing at low stocking rates with high offtake rates) has been poor, with fences being used mainly to exclude outsiders. The possibility of basing the design of schemes on existing patterns of resource utilisation has not been explored. Management committees have performed poorly. Numerous intra-community conflicts have demonstrated that communities are internally heterogeneous in complex ways and that the objectives of different interest groups cannot easily be reconciled.

4.2 Do Communal Land livestock owners practise opportunism?

The concept of "opportunism", summarised in section 2 above, may help us to understand the response of communities to grazing scheme policies. The possible utility of this concept in respect of Zimbabwean grazing schemes will be considered in relation to three aspects:

a) stocking rates
b) livestock movement
c) spatial heterogeneity of resources
d) rangeland types and dynamics

Stocking rates

Data on stocking rates in the case study grazing schemes show that these have remained high despite extension policies aimed at encouraging higher offtake through regular sales (Table 3.2). As pointed out above, in Zimbabwe the reason for this derives most fundamentally from the agro-pastoral nature of the production system and the multi-purpose functions of livestock. The draught, transport, manure and milk functions of cattle are particularly important.

Periodic crashes in livestock populations do occur, mainly as a result of severe droughts, although official destocking programmes have also contributed in the past (Scoones 1990c). Although only anecdotal evidence on fluctuations in livestock populations in the case study schemes could be gathered, residents of the schemes in Zimuto and Mwenezi reported severe losses during the 1982/4 drought, with less severe losses reported in Chamatamba. The Mwenezi schemes also suffered losses in the 1986/7 season.

After periods of high mortality people in these schemes attempted to rebuild their herds, and only the small minority with herds somewhat larger than ten animals generally considered the possibility of regular sales to the CSC. (Only in Chamatamba, located in a relatively high potential zone, was this strategy taken up by a significant number of herd owners, but even here they constituted only a small minority within the community.) In all schemes there was thus a constant upward pressure on stocking rates, broken by episodic events such as drought.

Livestock movement

Movement of herds allows for the exploitation of a variety of environments across space and time. In Zimbabwe the agro-pastoral character of Communal Land production systems means that cattle are generally kept near the homestead and overnight kraaling is practised throughout the year in most areas. Regular transhumant migration is thus not a feature of the Communal Lands[14]. Large scale migration in most areas is therefore undertaken mainly as a contingent response to unpredictable periods of low rainfall.

In Zimbabwe migration across long distances is, however, constrained by a number of factors. Communal Lands are often separated from each other by large tracts of fenced and privately-owned commercial farmland, and this restricts migration routes. Communal Lands themselves are mostly densely settled with high livestock populations, leaving little room for in-migrating herds (or even for herds *en route* somewhere else), and severe conflicts can result. Illegal "poaching" of grazing on commercial ranchland or resettlement schemes often takes place (The Chronicle 14/1/92). Veterinary regulations and fences for the control of Foot-and-Mouth Disease are major constraints to movement, and these have become particularly prominent since independence.

For these reasons there has probably been much less movement practised in recent years than in the past. Residents of Mangezi and Machingo grazing schemes reported that before independence they often moved their livestock onto commercial ranches within the district in drought years, after making an arrangement with the landowner, and occasionally migrated to distant Communal Lands with excess grazing (eg. Sengwe and Matibi II). People in Maraire and Mutakwa talked of having rented grazing from small scale and large scale farmers within Zimuto district during the drought in the early 1980s, and of having taken some of their cattle to relatives in other Communal Lands such as Chivi at times in the past. In Chamatamba, in a more favoured agro-ecological zone, there appears to have been much less resort to migration.

Despite these constraints migration is undertaken in periods of severe stress. Scoones (1989: 17-18) has documented a case of drought-induced movement in Mazvihwa in both 1982/3 and 1986/7. In this area localised migrations took place from a clayveld zone, which is particularly susceptible to forage shortages in dry years, to a more stable sandveld zone nearby. Migration to more distant areas was carried out as the drought lengthened. Scepticism as to the sustainability of a planned grazing scheme in the clayveld zone was expressed by local residents because of the restrictions on movement they thought the scheme would imply.

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[14] One exception is in parts of Matabeleland where dry season migration to water pans, along the lines described by Prestcott (1961) is still undertaken (see discussion in Scoones and Wilson 1989: 103-105).

In the case study schemes boundary fences were seen as important to keep neighbours' animals out, but also to keep their own animals in when unherded. In the period of the study no large scale migration was practised in any scheme. There is thus no clear evidence as to whether or not these grazing schemes frustrated opportunistic movements of stock, or indications as to the feasibility of using fenced paddocks in a flexible and adaptive manner which allows for mobility and the negotiation of "mutual aid" arrangements with other communities.

Spatial heterogeneity of resources

Analysis of habitat patch use by season in three of the case study schemes revealed that spatial heterogeneity is a vital element in rangeland resource use. Although there were clear differences between the schemes in respect of types of habitat patch and their relative availability (see discussion below), some general patterns emerged. Firstly, some habitats were clearly critical to the survival of livestock in the late dry season when forage resources were in limited supply. In all cases these included the riverine zones; in Mutakwa they included the vleis and drainage lines; in Chamatamba, the termite mounds; in Mangezi, the alluvium zone. In Mutakwa and Mangezi browsing was also observed to increase in intensity at this time of year. Secondly, crop residues and grass growing on contours were heavily utilised in all schemes in the early dry season. Thirdly, livestock spent considerable periods of time at home sites and kraals. Some of this time was "unproductive" since no feeding took place, but the high preference index values for this habitat also reflect the feeding of stored crop residues or supplementary feeds.

These data thus tend to confirm Scoones' analysis of the importance of "key resources" in Communal Land grazing systems (Scoones 1989; Behnke and Scoones 1991: 21-22). Although the lack of data for other years makes it difficult to assess exactly how the use of key resources in these schemes varies with rainfall, it seems likely that they are exploited in a contingent and flexible manner. Thus in wet years one would expect the "key resources" to be less heavily utilised than in periods of drought.

Rangeland types and dynamics

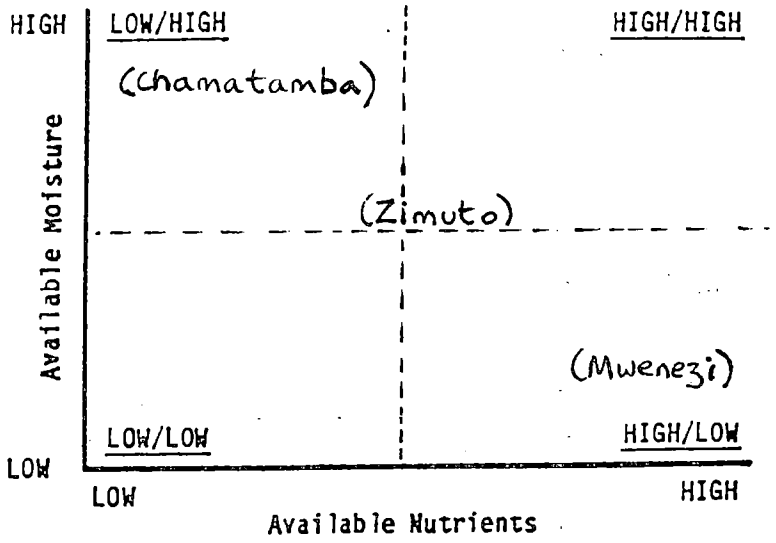
Behnke and Scoones (1991: 18-21) suggest a possible classification of different rangeland types, based on relationships between available soil moisture and soil nutrients and derived from classifications of savanna types (see Figure 3 in section 2 above).

The case study grazing schemes, located as they are in contrasting agro-ecological zones, can be classified according to this typology (Figure 13). Chamatamba, in Mhondoro, is found in the low nutrient/ high moisture type where equilibrium dynamics are more likely to be at work. The two Mwenezi schemes are in the high nutrient/low moisture type, with numbers of stock

fluctuating greatly in response to rainfall variability and quantity rather than quality of feed resources being a limiting factor. The two Zimuto schemes, in an area where the high moisture vleis compensate for unreliable rainfall and soils are of medium to poor fertility, appear to fall into an intermediate type.

Management interventions clearly need to recognise the differences in ecological context that these schemes display. In Chamatamba interventions aimed at changing botanical composition (through the controlled use of fire or through pasture improvement) may be most appropriate, and regulation of stock numbers may well be an important issue. In the Mwenezi schemes support for opportunistic "tracking" strategies is more relevant. In Zimuto improved management of key resources is probably most important.

Figure 13. Classification of case study grazing schemes by rangeland type



In general it appears that livestock owners in the Communal Lands of Zimbabwe do practise a form of opportunism similar in many ways to that undertaken by pastoralists in other parts of the continent. However, the sedentary nature of agro-pastoral production systems combined with high population densities means that mobility, and hence the viability of migratory strategies, is constrained. As a consequence the importance of spatial heterogeneity of resources at the local level has been enhanced. Grazing scheme designs have tended to ignore these factors and the uneven response to the schemes reflects this disjunction. In agro-ecological zones with higher rainfall there is greater stability of production and less need to resort to "tracking"

environmental variability, but even here the concept of opportunism helps us to understand why offtake rates remain low and how high stocking rates are able to be sustained.

4.3 Lessons for rangeland management policy

Are there rangeland management policies which would bring the objectives of government and Communal Land livestock owners closer together, and thus allow for the design of interventions more likely to be adopted? One clear implication of the case studies documented here is that the design of grazing schemes must be re-examined. Another is that the notion of "efficient opportunism" (Sandford 1983) must be taken seriously. Behnke and Scoones (1991: 24) suggest that

> Livestock development programmes based on opportunism would not attempt to suppress these fluctuations in livestock numbers, but to exploit them by developing mechanisms to promptly and profitably remove stock when it does not rain...

Policies in respect of livestock marketing, land tenure and herd movement, and institutional development ("pastoral administration") would need to be revised if the promotion of efficient opportunism became an objective.

Livestock marketing

A marketing system appropriate to the needs of Communal Land producers would be based on an acceptance of the multi-purpose nature of livestock production and the provision of draught power, manure and milk as the most important functions of cattle. The system would attempt to accommodate high levels of cattle sales in dry years, accept much lower levels in wet years, and help farmers acquire stock for rebuilding herds after the ending of droughts. Stock numbers would fluctuate in an attempt to track the changing "carrying capacity" of rangeland. Abel et al (1987) have outlined how such a system could work in Botswana, where livestock marketing, as in Zimbabwe, is dominated by a large parastatal.

The potential costs of such a system to government, however, are high. Abbatoir capacity would have to be maintained at a high level but remain underutilised in many years. Buying stock at reasonably high prices in poor years (to encourage farmers to sell) and helping farmers acquire stock in good years would involve expensive subsidies which may be only partially offset by a decrease in drought relief funding. Urban populations, often politically influential, might be unhappy with highly fluctuating beef supplies.

Sandford (1982) suggested that another important function of an appropriate marketing system would be to facilitate the buying and selling of cattle for draught purposes. He recommended encouraging inter-district trade, the emergence of private livestock traders and village livestock markets. This would

entail relaxing to a certain degree existing veterinary restrictions on inter-district movement, imposed mainly for prevention and control of Foot-and-Mouth Disease.

Sandford's recommendations to the Zimbabwean government were not taken up, and livestock marketing policy through the 1980s and early 1990s has resolutely retained its central focus on commercial beef production. The cornerstones of this policy are:

- support for the dominant position of the Cold Storage Commission (CSC)

- reliance on an EEC export quota for high-grade beef, which is essential for cross-subsidising low earning domestic sales

- attempting to prevent and control outbreaks of Foot-and-Mouth Disease by strict enforcement of veterinary restrictions on the movement of wildlife and domestic livestock

- attempting to increase beef offtake from the Communal Lands in order to supply the domestic market with cheap low-grade meat.

However, the beef industry in Zimbabwe has undergone a major crisis of confidence in recent years. The financial viability of the CSC has been in question, recurrent outbreaks of Foot-and-Mouth Disease have resulted in the periodic loss of the export market, supplies of imported feed ingredients have been inadequate, rising costs and controlled prices have undermined the viability of commercial enterprises, and consumers have been resistant to high prices for high grade beef (CFU 1988; Cross 1990). Questions have also been raised as to the appropriateness of raising beef cattle for export on large areas of potentially arable land in the high potential zones of the country, when there is an urgent need to acquire land in these zones for resettlement purposes (Raikes 1987; Scoones and Wilson 1989: 51; Cousins 1990: 56).

In this context any discussion of marketing policies which might facilitate opportunistic strategies in the Communal Lands cannot be separated from the debate on the beef industry as a whole. Re-orienting the marketing system to accomodate the needs of Communal Land producers may require accepting the loss of the EEC market, a change of emphasis from beef to other kinds of meat (eg. goat meat or white meat products) for the domestic market, shifting subsidies from consumers and commercial farmers to Communal Land producers, and redefining the role of the CSC in the industry. While the control of Foot-and-Mouth Disease would still be important, measures which did not involve such severe restrictions on movement could be considered, as Sandford (1982: 122) suggested.

Potential benefits of a strategic re-orientation of the industry, in addition to opening up the option of support for opportunism,

include the diversification of the meat industry, the encouragement of goat production in Communal Lands, more support for wildlife production enterprises, and greater freedom of manoeuvre in respect of resettlement planning for the high potential areas of the country (Cousins 1990: 54-56). If support for opportunism improves the prospects for improved management of communal rangeland, as the emergent literature suggests, then the argument for such a re-orientation is strengthened.

Herd movement and land tenure

If opportunism involves a high degree of herd mobility then it has implications for disease control measures which have to be considered by policy makers. As outlined above, in Zimbabwe the control of Foot-and-Mouth Disease has become critical to the export-oriented commercial beef industry, and the main control measure adopted is restrictions on stock movement between different zones within the country. Greater emphasis on other kinds of control measures might allow for much greater mobility of Communal Land herds, but to date there are no indications that this has been considered.

The implications of mobility for land tenure arrangements also run counter to the general thrust of present policies. Grazing schemes have been promoted within the framework of communal tenure, and attempted to institute a common property resource management regime based on the demarcation of exclusive territories with unambiguous boundaries. The case studies presented here suggest that the possibility of exclusion of non-members' livestock using donated fencing has been a major motivation for adoption of schemes. However, opportunistic migration involves access to resources in areas not permanently occupied or used, or to areas "belonging" to other groups of users. In this situation what kinds of tenure arangements are "capable of providing security of tenure while permitting flexibility of use patterns" (Behnke and Scoones 1991: 24)?

One advantage of allocating distinct territories to user groups (in Zimbabwe, "communities") is that institutional development can emerge from within and build upon a pre-existing social and political framework. Another is that "territorial control by specific groups of people .... internalises costs and benefits" (Abel and Blaikie 1989: 21). Retaining these advantages but permitting access by outsiders to rangeland resources thus implies that this access has to be negotiated, agreed and co-ordinated. Abel and Blaikie suggest that "groups must be able to negotiate reciprocal, paid-for grazing arrangements to cope with spatial variation in rainfall" (1989: 21).

Arrangements permitting drought-induced migration in Zimbabwe have included renting of commercial ranch grazing by Communal land herdowners, and clearly rent is one feasible institutional form. Less formal arrangements made in the past have included the mobilisation of kinship obligations, but these, as with renting, have been individualised rather than communal in character. The Model D resettlement model being implemented in South Gwanda

proposes a form of co-ordinated access to range on a former commercial ranch, with different communities making use of this grazing in rotation, but on a regularised rather than contingent basis. In general there are few precedents for secure, flexible and co-ordinated tenure arrangements involving groups rather than individuals. Institutional innovation is clearly necessary.

Spatial heterogeneity and the existence of key habitat patches within grazing territories imply that in dry years it is access to these high quality resources that will be critical. Their relative scarcity and uneven distribution across landscapes will make the negotiation of access in crisis years particularly difficult, but a clearer focus on the management and enhancement of key resources would undoubtedly support the search for appropriate institutional regimes to govern their use.

Institutional development

The emerging perspective on opportunism indicates that African livestock producers often have a better understanding of specific problems and opportunities in local environments than centralised bureaucracies promoting standardised "packages" of recommendations. To Behnke and Scoones (1991: 25) this suggests that a more appropriate management model would involve

> .... less rather than more centralised regulation, the devolution of control over local resources to producers and producer groups, and a shift in emphasis from enforcement to monitoring critical developments and servicing local needs.

However, analysis of decision-making in the five grazing schemes described in this report suggests that "producer groups" are far from homogeneous, often comprising diverse interest groupings with different, and sometimes conflicting, objectives. Questions of access to and control over land and resources usually involve complex power struggles within communities, and these often implicate external agencies and structures of authority. Recommendations to "devolve control" and "service local needs" fail to explicitly address the questions of "control to which interest group?" and "whose needs?"

In the current political and economic climate the notion of less rather than more governmental control will clearly resonate with other kinds of policy thrusts, and it may be argued that local power struggles should be left to themselves. Since some role for the state or other agencies is still envisaged, however, the question of how even minimalist interventions articulate with local struggles, and whose interests they serve, cannot be avoided.

The case studies also demonstrate how local institutions, even those with a supposedly "traditional" character, have been deeply impacted upon by state interventions in both the colonial and post-colonial periods. This has left a legacy of ambiguity and fluidity in institutional and power relations which will not be

resolved by simple withdrawal. As the literature on common property makes clear, issues of power and authority are central to the evolution of property regimes, and in the contemporary world this unavoidably involves relationships between local and central authority. This dichotomy is itself too simple, since what is is usually at issue is a hierarchy of institutions dealing with land, development planning, support services, and governance in general.

What this suggests is that "co-management" models (Lawry 1990) of common property may be more appropriate than "devolution of control". This will involve radical changes in emphasis of the kind Behnke and Scoones indicate, (eg. from enforcement to monitoring events and servicing needs, abandoning the "blueprint" approach to resource management etc), but also increase the urgency of the search for adequate institutional arrangements for planning, implementation, monitoring, regulation, arbitration, and rule enforcement within communal grazing regimes. No ready-made models exist and innovation and a learning-process approach are required; the complexity and difficulty of the task should not be underestimated.

From a co-management perspective the experiences of the case study grazing schemes reported here suggest that government departments concerned with resource management in Communal Lands will have to develop the capacity to undertake the following roles:

* promoting the emergence of local institutions which have legitimacy and are effective decision-making bodies

* assisting the evolution of a legal framework (ie. a set of grazing management by-laws) which is locally accepted and enforceable

* servicing resource planning and management by local institutions which builds on local ecological understandings

* facilitating bargaining and negotiated compromises between communities, and user groups within communities, in cases of conflict or when migratory strategies were being considered.

Given the poor performance of government departments to date in respect of institutional development (for example, in relation to VIDCO development), and the likelihood of declining levels of government spending on rural development, the prospects for this kind of capacity-building exercise may not appear to be good. However, it is being increasingly recognised that achieving sustainable development in Africa will require the mobilisation of human resources as much as appropriate technical expertise and capital investment. Institution building is coming to be seen a foundation stone rather than an afterthought in the design of rural development. This re-ordering of priorities now needs to be translated into practical policies and programmes.

Grazing scheme design

As outlined above, the demarcation of exclusive grazing territories and their allocation to particular user groups or communities does not necessarily preclude migration out of or into these territories when the need arises. Stable tenure arrangements which allow co-ordinated access to critical range resources by different groups are feasible; grazing schemes and opportunism are not inherently antithetical. The central issue is rather the design of management systems and institutional regimes which have a better fit with the objectives and practices of livestock herds and herdowners on communal rangelands in Africa.

Event-driven movement is one dimension which needs to be taken account of; another is that of spatial heterogenity within grazing territories. An understanding of the critical role of the "patchiness" of rangeland habitats has prompted suggestions for alternative grazing scheme designs. Scoones (1989) proposed "key resource schemes" which would establish a system of regulated use of key habitat patches. These would be locally specific, address critical constraints (eg. quality vs quantity of forage), and be relevant to the objectives and management capabilities of the community concerned. Community members, with their fine-tuned understanding of local resource dynamics, would be the primary participants in the design and development of these schemes. Abel and Blaikie (1989: 21) make similar suggestions: grazing territories should be established taking into account spatial and temporal variations in the quality and quantity of forage and water, perhaps using "ecological fencing" to separate habitat types with different degrees of resilience and resource endowments.

The problem with both of these proposals is their extreme generality and lack of detail. To date no attempts have been made to flesh out these ideas or examine how they would be translated into practical reality in specific situations. Grazing schemes continue to be planned as Short Duration Grazing systems[15].

The time would appear ripe to put these ideas for alternative designs to the test. The new paradigm on rangeland ecology is still evolving and a great deal of more research on non-equilibrium dynamics and opportunistic strategies is required. The most appropriate course of action is thus to implement a small number of pilot projects which explore the management implications of these ideas, in a form of action-research. The active participation of community members in the design process would have to be sought. Experience suggests that many rural communities would be eager to participate in such projects, but that the complexity of decision-making dynamics would require a

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[15] Unconfirmed reports suggest that a possible exception in Zimbabwe may be the planning and implementation of a few schemes based on Savory's Holistic Resource Management model.

great deal of attention to the institutional issues discussed here.

Pilot projects would also have to take into account a range of agro-ecological conditions, and the rangeland typology proposed by Behnke and Scoones would be useful in setting the parameters of the exercise. Following the classification of the case study schemes given above, one might propose pilot projects of the following broad types:

(i) Schemes in arid and semi-arid zones where rainfall is highly variable and rangeland dynamics are of a non-equiibrium nature. These would be based on opportunistic tracking of forage fluctuations through varying stock numbers across time and space and planning for migratory movement. Development of the browse resource through tree planting could be explored. Location: the dry south and south west of the country.

(ii) Schemes where spatial heterogeneity of rangeland resources at a local level is critical for sustainable production, and the option of migratory movement is less available. Designs would involve the fencing of key resources and their regulated use by selected types of stock, and the enhancement or upgrading of these resource patches. Location: areas with variable rainfall but high prevalence of vleis, drainage lines, riverine zones or similar habitats.

(iii) Schemes in higher potential zones where soil nutrients are a limiting factor. Designs could explore the more efficient utilisation of what key resources exist, the supplementation of natural forage with cultivated forage crops, and improving the quality of the botanical composition of rangeland (ie. intensification measures).

4.4 Conclusion

The increasingly obvious failure of conventional approaches to the management of communal rangeland makes the search for alternative perspectives and interventions more credible. In Zimbabwe the large amounts of state and donor funds spent on fencing of paddocks in Short Duration Grazing schemes has begun to be questioned, but no proven alternative has yet evolved. The emerging paradigm in rangeland ecology helps us to understand why the conventional approach has not been more positively responded to by Communal Land producers, and suggests a way forward. Given the relative infancy of the new perspective, however, the management and policy implications are not entirely clear. An action-research programme made up of a number of pilot projects exploring different kinds of intervention is urgently needed.

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